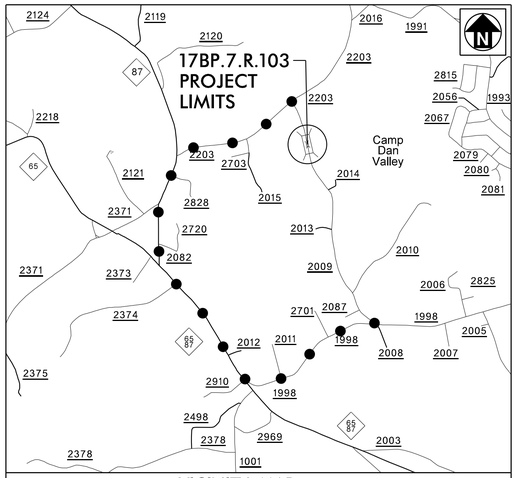
CONTRACT: TIP PROJECT: 17BP.7.R.103



STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

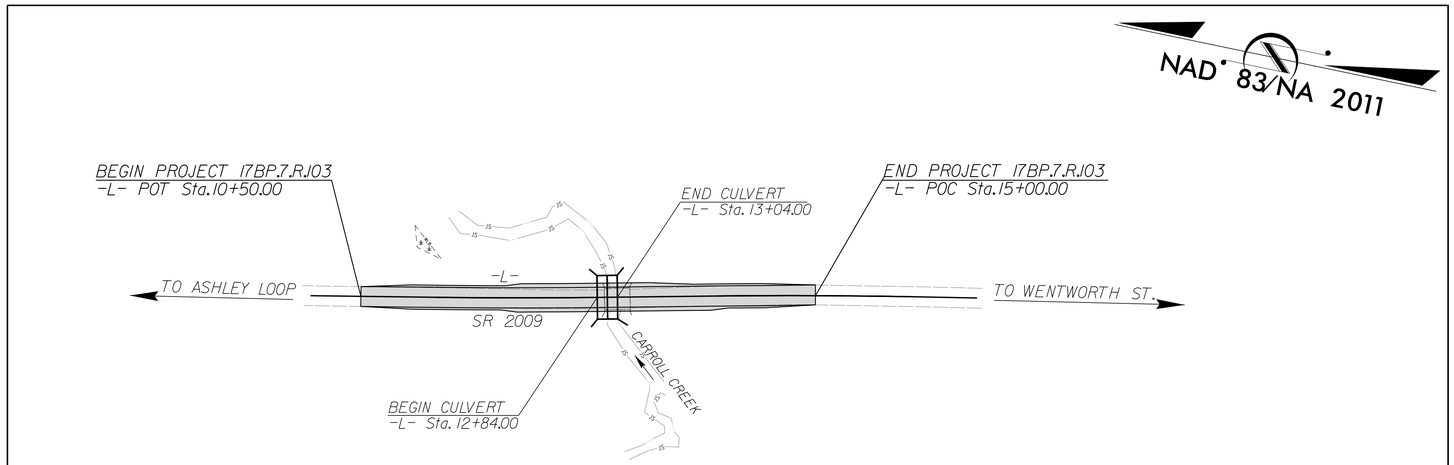
ROCKINGHAM COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17BP.7.R.103	1	

STATE PROJECT NO.	F.A. PROJ. NO.	DESCRIPTION

LOCATION: BRIDGE NO. 248 OVER CARROLL CREEK ON SR 2009 (CAMP DAN VALLEY ROAD)

TYPE OF WORK: GRADING, PAVING, DRAINAGE AND CULVERT



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STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DESIGN DATA

ADT 2011 = 720

ADT 2025 = 1440

V = 45 MPH

SUB REGIONAL TIER
LOCAL

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT = 0.081 MILES

LENGTH STRUCTURE TIP PROJECT = 0.004 MILES

TOTAL LENGTH TIP PROJECT = 0.085 MILES

Prepared in the Office of Hatch Mott MacDonald for

DIVISION 7

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

2012 STANDARD SPECIFICATIONS

LETTING DATE:

TIM JORDAN, PE
PROJECT ENGINEER

DAVID FUH, PE
HYDRAULICS ENGINEER

NCDOT CONTACT: TIM POWERS, PE
DIVISION BRIDGE PROGRAM MANAGER

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 21102 ENGINEER JAMES TIMOTHY JORDAN

DocuSigned by: Jame Timothy Jordan 4/14/2017
SIGNATURE: P.E.

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 19732 ENGINEER SHIH-CHEN FUH

DocuSigned by: Shihchen Fuh 4/14/2017
SIGNATURE: P.E.

PLANS PREPARED BY:

MOTT MACDONALD
PO Box 700
Fuquay–Varina, NC 27526
(919) 552–2253
(919) 552–2254 (Fax)
www.mottmac.com

LICENSE NO. F–0669

ICA Engineering
5121 Kingdom Way, Suite 100
Raleigh, NC 27607
NC License No: F-0258

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GENERAL NOTES:

2012 SPECIFICATIONS
EFFECTIVE: 01-17-2012
REVISED: 10-31-2014

GRADE LINE:
GRADING AND SURFACING:

THE GRADE LINES SHOWN DENOTE THE FINISHED ELEVATION OF THE PROPOSED SURFACING AT GRADE POINTS SHOWN ON THE TYPICAL SECTIONS. GRADE LINES MAY BE ADJUSTED AT THEIR BEGINNING AND ENDING AND AT STRUCTURES AS DIRECTED BY THE ENGINEER IN ORDER TO SECURE A PROPER TIE-IN.

CLEARING:

CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD II.

SUPERELEVATION:

ALL CURVES ON THIS PROJECT SHALL BE SUPERELEVATED IN ACCORDANCE WITH STD. NO. 225.04 USING THE RATE OF SUPERELEVATION AND RUNOFF SHOWN ON THE PLANS. SUPERELEVATION IS TO BE REVOLVED ABOUT THE GRADE POINTS SHOWN ON THE TYPICAL SECTIONS.

SHOULDER CONSTRUCTION:

ASPHALT, EARTH, AND CONCRETE SHOULDER CONSTRUCTION ON THE HIGH SIDE OF SUPERELEVATED CURVES SHALL BE IN ACCORDANCE WITH STD. NO. 560.01

GUARDRAIL:

THE GUARDRAIL LOCATIONS SHOWN ON THE PLANS MAY BE ADJUSTED DURING CONSTRUCTION AS DIRECTED BY THE ENGINEER. THE CONTRACTOR SHOULD CONSULT WITH THE ENGINEER PRIOR TO ORDERING GUARDRAIL MATERIAL.

SUBSURFACE PLANS:

NO SUBSURFACE PLANS ARE AVAILABLE ON THIS PROJECT. THE CONTRACTOR SHOULD MAKE HIS OWN INVESTIGATION AS TO THE SUBSURFACE CONDITIONS.

UTILITIES:

UTILITY OWNERS ON THIS PROJECT ARE DUKE ENERGY, AT&T AND DAN RIVER WATER.

ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS.

INDEX OF SHEETS

EFF. 01-17-2012
REV. 02-29-16

2012 ROADWAY ENGLISH STANDARD DRAWINGS

The following Roadway Standards as appear in "Roadway Standard Drawings" Highway Design Branch - N. C. Department of Transportation - Raleigh, N. C., Dated January, 2012 are applicable to this project and by reference hereby are considered a part of these plans:

STD.NO.	TITLE
DIVISION 2 - EARTHWORK	
200.02	Method of Clearing - Method II
225.02	Guide for Grading Subgrade - Secondary and Local
225.04	Method of Obtaining Superelevation - Two Lane Pavement
DIVISION 5 - SUBGRADE, BASES AND SHOULDERS	
560.01	Method of Shoulder Construction - High Side of Superelevated Curve - Method I
DIVISION 8 - INCIDENTALS	
862.01	Guardrail Placement
862.02	Guardrail Installation
876.01	Rip Rap in Channels
876.04	Drainage Ditches with Class 'B' Rip Rap

PROJECT REFERENCE	SHEET NO.
17BP.7.R.103 - ROCKINGHAM 248	1-A

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 21102 ENGINEER JAMES TIMOTHY JORDAN

DocuSigned by: James Timothy Jordan 3A6529B19D2A444...

4/14/2017

MOTT MACDONALD I& E, LLC
LICENSE NO. F-0669

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PROJECT REFERENCE	SHEET NO.
17BP.7.R.103 – ROCKINGHAM 248	1–8

Note: Not to Scale

**S.U.E. = Subsurface Utility Engineering*

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

BOUNDARIES AND PROPERTY:

- State Line
- County Line
- Township Line
- City Line
- Reservation Line
- Property Line
- Existing Iron Pin — EIP
- Property Corner
- Property Monument — ECM
- Parcel/Sequence Number — 123
- Existing Fence Line
- Proposed Woven Wire Fence
- Proposed Chain Link Fence
- Proposed Barbed Wire Fence
- Existing Wetland Boundary — WLB
- Proposed Wetland Boundary — WLB
- Existing Endangered Animal Boundary — EAB
- Existing Endangered Plant Boundary — EPB
- Existing Historic Property Boundary — HPB
- Known Contamination Area: Soil
- Potential Contamination Area: Soil
- Known Contamination Area: Water
- Potential Contamination Area: Water
- Contaminated Site: Known or Potential

BUILDINGS AND OTHER CULTURE:

- Gas Pump Vent or U/G Tank Cap
- Sign — S
- Well — W
- Small Mine
- Foundation
- Area Outline
- Cemetery
- Building
- School
- Church
- Dam

HYDROLOGY:

- Stream or Body of Water
- Hydro, Pool or Reservoir
- Jurisdictional Stream — JS
- Buffer Zone 1 — BZ 1
- Buffer Zone 2 — BZ 2
- Flow Arrow
- Disappearing Stream
- Spring
- Wetland
- Proposed Lateral, Tail, Head Ditch — FLOW
- False Sump

RAILROADS:

- Standard Gauge — CSX TRANSPORTATION
- RR Signal Milepost — MILEPOST 35
- Switch — SWITCH
- RR Abandoned
- RR Dismantled

RIGHT OF WAY:

- Baseline Control Point
- Existing Right of Way Marker
- Existing Right of Way Line
- Proposed Right of Way Line — RW
- Proposed Right of Way Line with Iron Pin and Cap Marker — RW
- Proposed Right of Way Line with Concrete or Granite R/W Marker — RW
- Proposed Control of Access Line with Concrete C/A Marker — CA
- Existing Control of Access — CA
- Proposed Control of Access — CA
- Existing Easement Line — E
- Proposed Temporary Construction Easement — E
- Proposed Temporary Drainage Easement — TDE
- Proposed Permanent Drainage Easement — PDE
- Proposed Permanent Drainage / Utility Easement — DUE
- Proposed Permanent Utility Easement — PUE
- Proposed Temporary Utility Easement — TUE
- Proposed Aerial Utility Easement — AUE
- Proposed Permanent Easement with Iron Pin and Cap Marker

ROADS AND RELATED FEATURES:

- Existing Edge of Pavement
- Existing Curb
- Proposed Slope Stakes Cut — C
- Proposed Slope Stakes Fill — F
- Proposed Curb Ramp — CR
- Existing Metal Guardrail
- Proposed Guardrail
- Existing Cable Guiderail
- Proposed Cable Guiderail
- Equality Symbol
- Pavement Removal

VEGETATION:

- Single Tree
- Single Shrub
- Hedge
- Woods Line
- Orchard
- Vineyard — Vineyard

EXISTING STRUCTURES:

MAJOR:

- Bridge, Tunnel or Box Culvert — CONC
- Bridge Wing Wall, Head Wall and End Wall — CONC WW

MINOR:

- Head and End Wall — CONC HW
- Pipe Culvert
- Footbridge
- Drainage Box: Catch Basin, DI or JB — CB
- Paved Ditch Gutter
- Storm Sewer Manhole — S
- Storm Sewer — S

UTILITIES:

POWER:

- Existing Power Pole
- Proposed Power Pole
- Existing Joint Use Pole
- Proposed Joint Use Pole
- Power Manhole — P
- Power Line Tower
- Power Transformer
- U/G Power Cable Hand Hole
- H–Frame Pole
- U/G Power Line LOS B (S.U.E.*) — P
- U/G Power Line LOS C (S.U.E.*) — P
- U/G Power Line LOS D (S.U.E.*) — P

TELEPHONE:

- Existing Telephone Pole
- Proposed Telephone Pole
- Telephone Manhole — T
- Telephone Pedestal — T
- Telephone Cell Tower
- U/G Telephone Cable Hand Hole — HH
- U/G Telephone Cable LOS B (S.U.E.*) — T
- U/G Telephone Cable LOS C (S.U.E.*) — T
- U/G Telephone Cable LOS D (S.U.E.*) — T
- U/G Telephone Conduit LOS B (S.U.E.*) — TC
- U/G Telephone Conduit LOS C (S.U.E.*) — TC
- U/G Telephone Conduit LOS D (S.U.E.*) — TC
- U/G Fiber Optics Cable LOS B (S.U.E.*) — T FO
- U/G Fiber Optics Cable LOS C (S.U.E.*) — T FO
- U/G Fiber Optics Cable LOS D (S.U.E.*) — T FO

WATER:

- Water Manhole — W
- Water Meter
- Water Valve
- Water Hydrant
- U/G Water Line LOS B (S.U.E*) — W
- U/G Water Line LOS C (S.U.E*) — W
- U/G Water Line LOS D (S.U.E*) — W
- Above Ground Water Line — A/G Water

TV:

- TV Pedestal — C
- TV Tower
- U/G TV Cable Hand Hole — HH
- U/G TV Cable LOS B (S.U.E.*) — TV
- U/G TV Cable LOS C (S.U.E.*) — TV
- U/G TV Cable LOS D (S.U.E.*) — TV
- U/G Fiber Optic Cable LOS B (S.U.E.*) — TV FO
- U/G Fiber Optic Cable LOS C (S.U.E.*) — TV FO
- U/G Fiber Optic Cable LOS D (S.U.E.*) — TV FO

GAS:

- Gas Valve
- Gas Meter
- U/G Gas Line LOS B (S.U.E.*) — G
- U/G Gas Line LOS C (S.U.E.*) — G
- U/G Gas Line LOS D (S.U.E.*) — G
- Above Ground Gas Line — A/G Gas

SANITARY SEWER:

- Sanitary Sewer Manhole
- Sanitary Sewer Cleanout
- U/G Sanitary Sewer Line — SS
- Above Ground Sanitary Sewer — A/G Sanitary Sewer
- SS Forced Main Line LOS B (S.U.E.*) — FSS
- SS Forced Main Line LOS C (S.U.E.*) — FSS
- SS Forced Main Line LOS D (S.U.E.*) — FSS

MISCELLANEOUS:

- Utility Pole
- Utility Pole with Base
- Utility Located Object
- Utility Traffic Signal Box — S
- Utility Unknown U/G Line LOS B (S.U.E.*) — ?UTL
- U/G Tank; Water, Gas, Oil
- Underground Storage Tank, Approx. Loc. — UST
- A/G Tank; Water, Gas, Oil
- Geoenvironmental Boring
- U/G Test Hole LOS A (S.U.E.*)
- Abandoned According to Utility Records — AATUR
- End of Information — E.O.I.

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PROJECT REFERENCE	SHEET NO.
17BP.7.R.103 – ROCKINGHAM 248	2

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 21102 TIMOTHY JORDAN

4/14/2017

MOTT MACDONALD I& E, LLC LICENSE NO. F-0669

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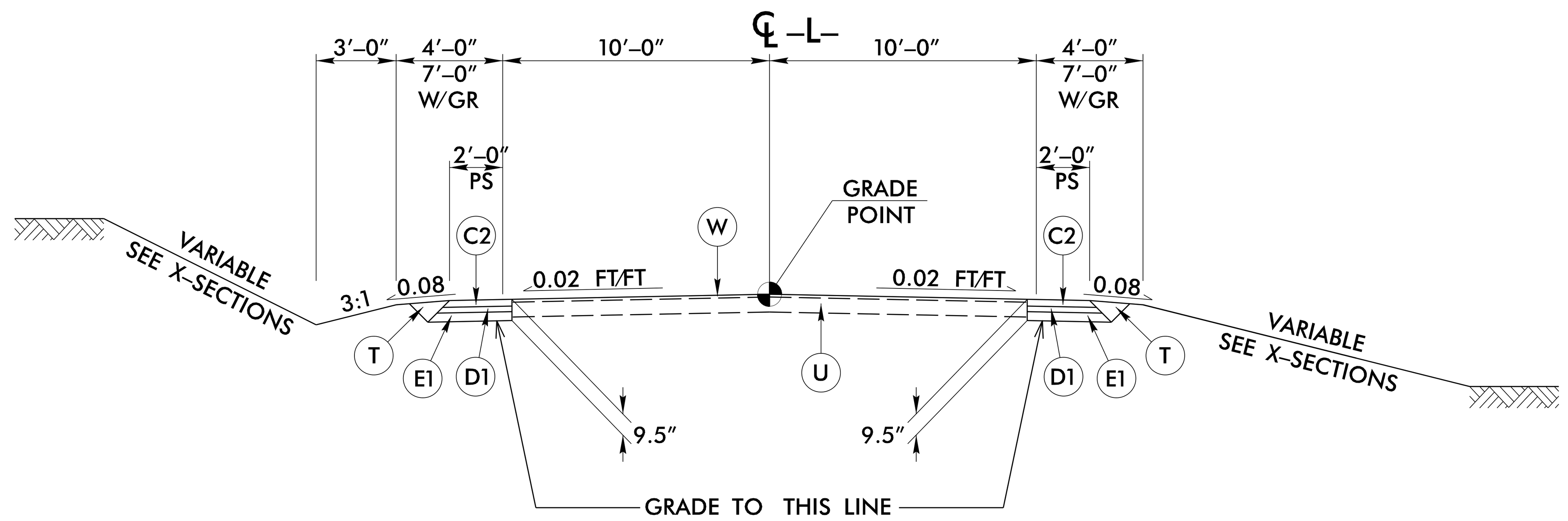
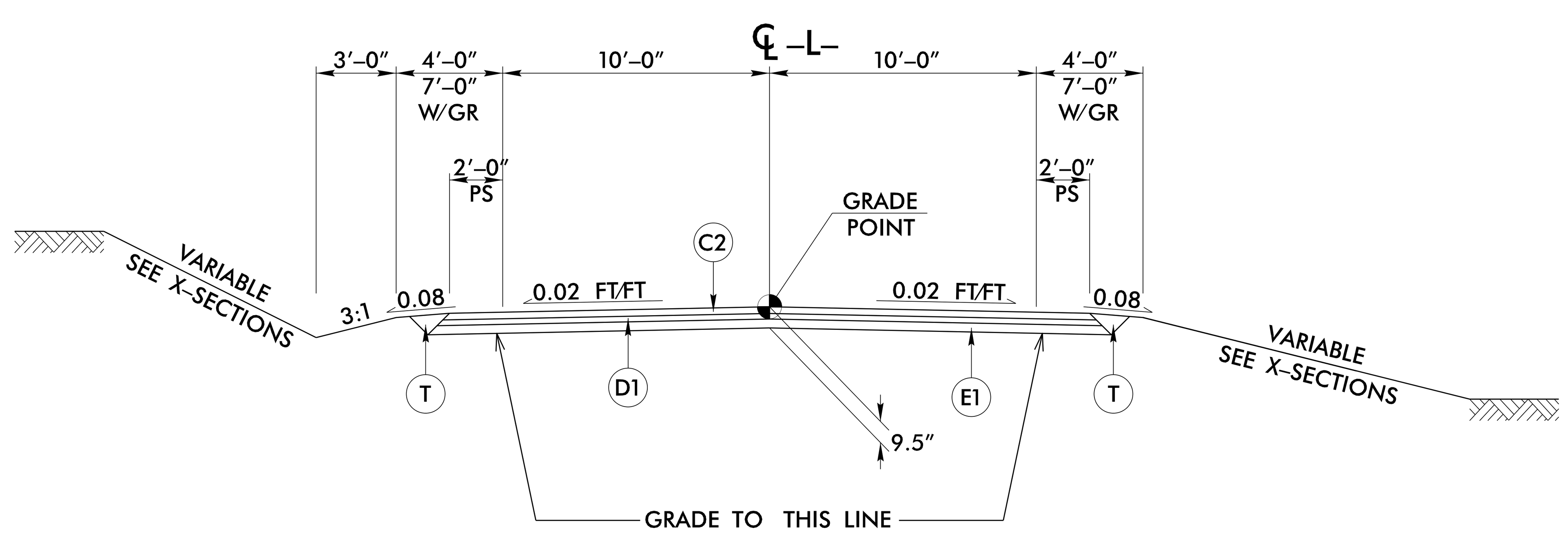


TYPICAL SECTION NO. 1

TRANSITION FROM EXISTING TO TYPICAL SECTION NO. 1:
–L– STA 10+50.00 TO 11+00.00

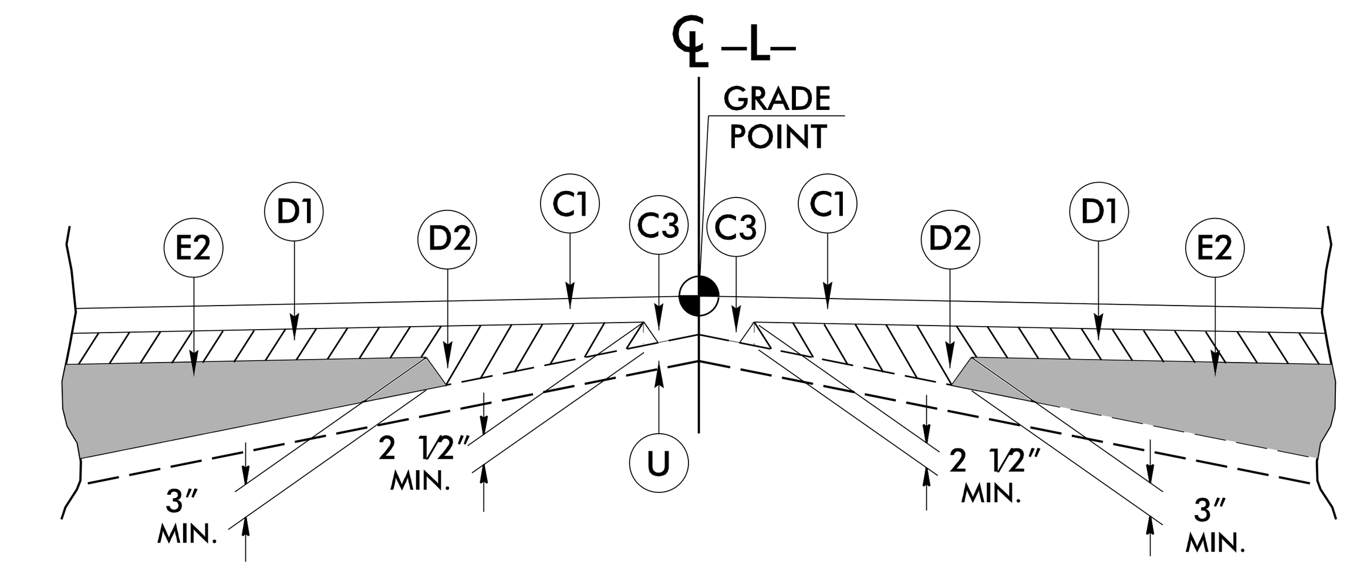
USE TYPICAL SECTION NO. 1:
–L– STA 11+00.00 TO 11+90.00
–L– STA 13+80.00 TO 14+50.00

TRANSITION FROM TYPICAL SECTION NO. 1 TO EXISTING:
–L– STA 14+50.00 TO 15+00.00



TYPICAL SECTION NO. 2

USE TYPICAL SECTION NO. 2:
–L– STA 11+90.00 TO 13+80.00



Detail Showing Method of Wedging

PAVEMENT SCHEDULE	
C1	PROP. APPROX. 1½" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.
C2	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C3	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 1½" IN DEPTH OR GREATER THAN 2" IN DEPTH.
D1	PROP. APPROX. 2½" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YD.
D2	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 2½" IN DEPTH OR GREATER THAN 4" IN DEPTH.
E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH TO BE PLACED IN LAYERS NOT LESS THAN 3" IN DEPTH OR GREATER THAN 5½" IN DEPTH.
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
W	WEDGING (SEE DETAIL SHOWING METHOD OF WEDGING).

NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.

PROJECT REFERENCE	SHEET NO.
17BP.7.R.103 – ROCKINGHAM 248	3

"N" = DISTANCE FROM EDGE OF LANE TO FACE OF GUARDRAIL.
TOTAL SHOULDER WIDTH = DISTANCE FROM EDGE OF TRAVEL LANE TO SHOULDER BREAK POINT.
FLARE LENGTH = DISTANCE FROM LAST SECTION OF PARALLEL GUARDRAIL TO END OF GUARDRAIL.
W = TOTAL WIDTH OF FLARE FROM BEGINNING OF TAPER TO END OF GUARDRAIL.
G = GATING IMPACT ATTENUATOR TYPE 350
NG = NON-GATING IMPACT ATTENUATOR TYPE 350

GUARDRAIL SUMMARY

SURVEY LINE	BEG. STA.	END STA.	LOCATION	LENGTH			WARRANT POINT		"N" DIST. FROM E.O.L.	TOTAL SHOULDER WIDTH	FLARE LENGTH		W		ANCHORS								IMPACT ATTENUATOR TYPE 350			REMARKS
				STRAIGHT	SHOP CURVED	DOUBLE FACED	APPROACH END	TRAILING END			APPROACH END	TRAILING END	APPROACH END	TRAILING END	AT–1	GRAU 350 TL–2	TYPE III							PERMITTED		
																							NO.	G	NG	
–L–	12+10 +/–	13+92.5 +/–	RT	187.50′			12+84.00 (CULVERT)	13+04.00 (CULVERT)	4′	7′						2										
–L–	12+09 +/–	13+46 +/–	LT	131.25′	12.50′		12+84.00 (CULVERT)	13+04.00 (CULVERT)	4′	7′					1	1										
		SUBTOTAL		318.75′	12.50′																					
		LESS ANCHOR DEDUCTIONS																								
		GRAU–350 TL–2 3 x 25.00′ =		–75.00′																						
		AT–1 1 x 8.25′ =		–8.25′																						
		TOTAL		237.50′	12.50′										1	3										

SUMMARY OF EARTHWORK
IN CUBIC YARDS

LOCATION	UNCLASSIFIED EXCAVATION	UNDERCUT	EMBT+%	BORROW	WASTE
–L– 10+50.00 TO 15+00.00	14		859	845	
SUBTOTAL	14		859	845	
WASTE IN LIEU OF BORROW					
PROJECT TOTAL	14			845	
5% TO REPLACE BORROW				43	
GRAND TOTAL	14			888	
SAY	20			940	

NOTE: Approximate quantities only. Unclassified Excavation, Borrow Excavation, Fine Grading, Clearing and Grubbing and Removal of Existing Asphalt Pavement will be paid for at the contract Lump Sum price for "Grading".

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PROJECT REFERENCE	SHEET NO.
17BP.7.R.103 – ROCKINGHAM 248	4

ROADWAY DESIGN ENGINEER — SEAL 21102 — JAMES TIMOTHY JORDAN — 4/14/2017

HYDRAULICS ENGINEER — SEAL 19732 — 4/14/2017

MOTT MACDONALD I&E, LLC LICENSE NO. F-0669

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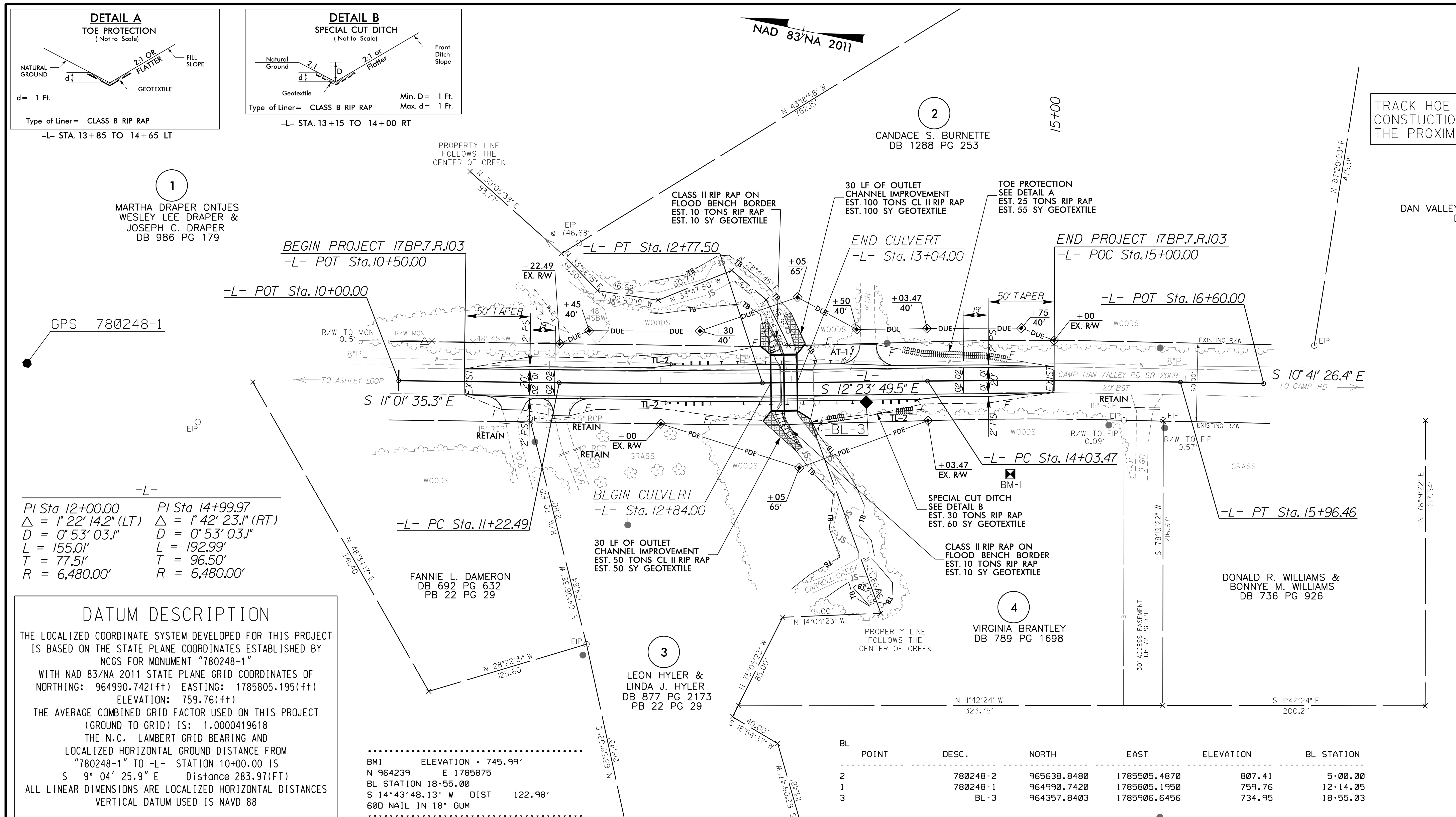
ICA Engineering, 5121 Kingdom Way, Suite 100, Raleigh, NC 27607

VERTICAL SCALE 5' 0 5' 10' — HORIZONTAL SCALE 25' 0 25' 50'

TRACK HOE EXCAVATOR SHALL BE USED FOR CONSTUCTION IN LIEU OF A CRANE DUE TO THE PROXIMITY OF OVERHEAD POWER LINES



-L-

PI Sta 12+00.00	PI Sta 14+99.97
Δ = 1° 22' 14.2" (LT)	Δ = 1° 42' 23.1" (RT)
D = 0° 53' 03.1"	D = 0° 53' 03.1"
L = 155.01'	L = 192.99'
T = 77.51'	T = 96.50'
R = 6,480.00'	R = 6,480.00'

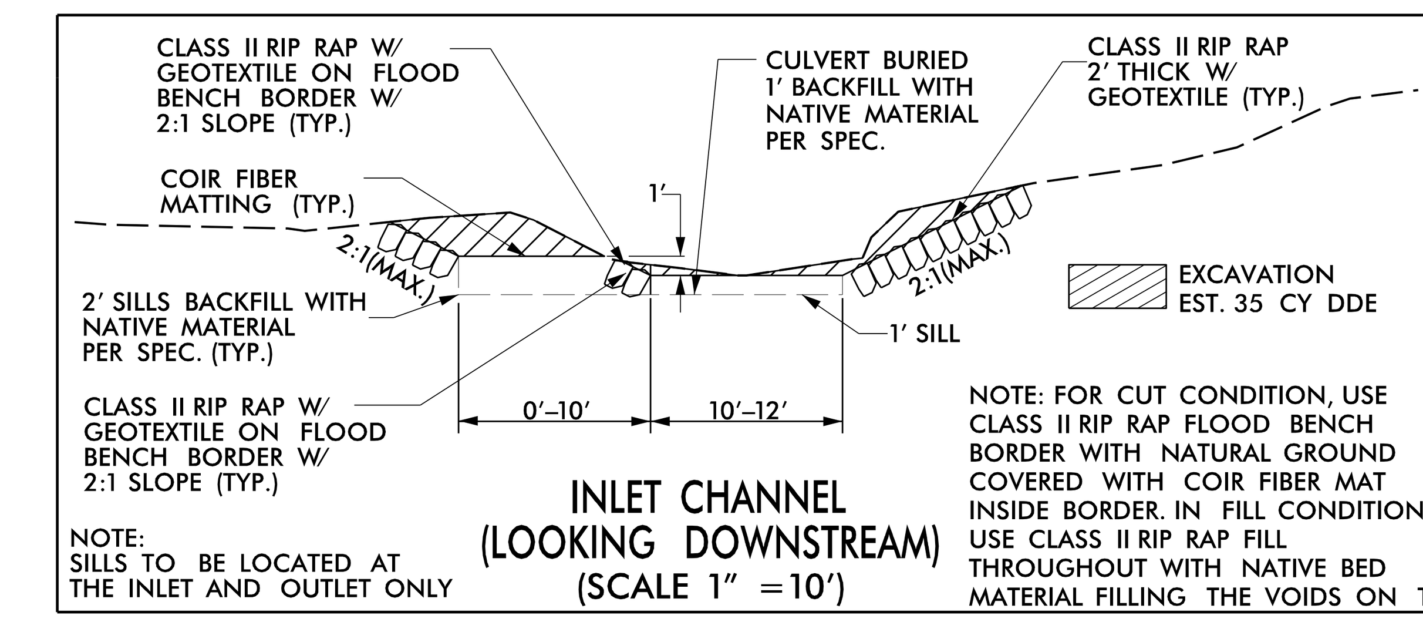
DATUM DESCRIPTION

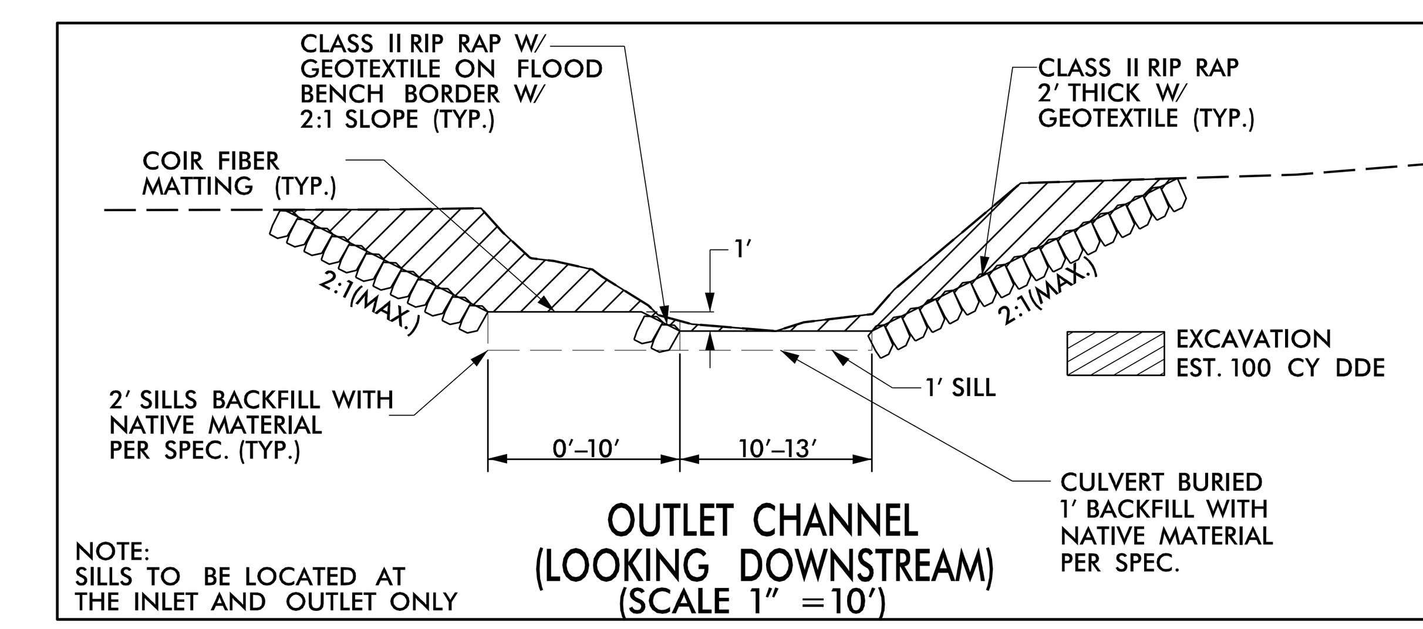
THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCGS FOR MONUMENT "780248-1"
WITH NAD 83/NA 2011 STATE PLANE GRID COORDINATES OF NORTHING: 964990.742(ft) EASTING: 1785805.195(ft) ELEVATION: 759.76(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 1.0000419618
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "780248-1" TO -L- STATION 10+00.00 IS S 9° 04' 25.9" E Distance 283.97(FT)
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

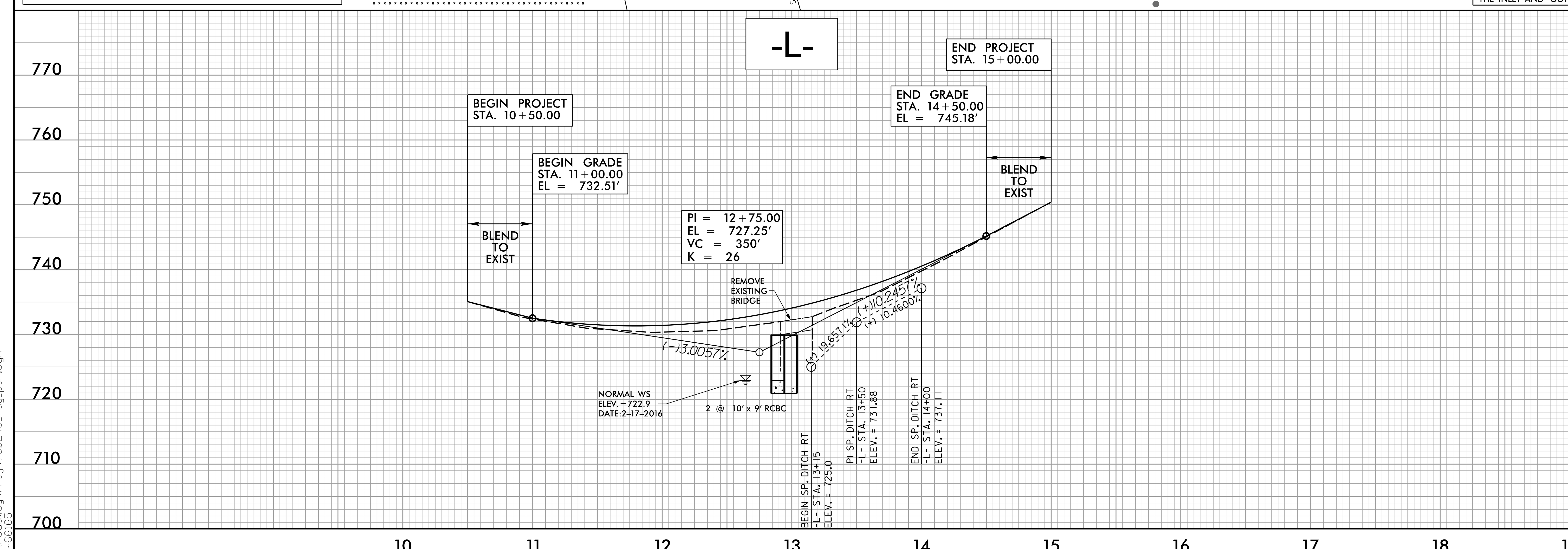
BM1 ELEVATION = 745.99'
N 964239 E 1785875
BL STATION 18+55.00
S 14°43'48.13" W DIST 122.98'
60D NAIL IN 18" GUM

BL

POINT	DESC.	NORTH	EAST	ELEVATION	BL STATION
2	780248-2	965638.8480	1785505.4870	807.41	5+00.00
1	780248-1	964990.7420	1785805.1950	759.76	12+14.05
3	BL-3	964357.8403	1785906.6456	734.95	18+55.03







CULVERT HYDRAULIC DATA

DESIGN DISCHARGE	= 1000	CFS
DESIGN FREQUENCY	= 25	YRS
DESIGN HW ELEVATION	= 729.2	FT
BASE DISCHARGE	= 1200	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 730.06	FT
OVERTOPPING DISCHARGE	= 1460	CFS
OVERTOPPING FREQUENCY	= 500+/-	YRS
OVERTOPPING ELEVATION	= 731.3	FT
DATE OF SURVEY	= 2-17-2016	
W.S. ELEVATION AT DATE OF SURVEY	= 722.9	FT

THE FOLLOWING ROADWAY STANDARDS AS APPEAR IN "ROADWAY STANDARD DRAWINGS" – HIGHWAY DESIGN BRANCH– N.C. DEPARTMENT OF TRANSPORTATION – RALEIGH, N.C., DATED JANUARY 2012 ARE APPLICABLE TO THIS PROJECT AND BY REFERENCE HEREBY ARE CONSIDERED A PART OF THESE PLANS:

STD.	TITLE
1101.03	TEMPORARY ROAD CLOSURES
1110.01	STATIONARY WORK ZONE SIGNS
1145.01	BARRICADES
1205.01	PAVEMENT MARKINGS – LINE TYPES AND OFFSETS
1205.02	PAVEMENT MARKINGS – TWO–LANE AND MULTI–LANE ROADWAYS
1205.12	PAVEMENT MARKINGS – BRIDGES
1261.01	GUARDRAIL AND BARRIER DELINEATORS – INSTALLATION SPACING
1261.02	GUARDRAIL AND BARRIER DELINEATORS – TYPES AND MOUNTING
1262.01	GUARDRAIL END DELINEATION

GENERAL NOTES

CHANGES MAY BE REQUIRED WHEN PHYSICAL DIMENSIONS IN THE DETAIL DRAWINGS, STANDARD DETAILS, AND ROADWAY DETAILS ARE NOT ATTAINABLE TO MEET FIELD CONDITIONS OR RESULT IN DUPLICATE OR UNDESIRED OVERLAPPING OF DEVICES. MODIFICATION MAY INCLUDE: MOVING, SUPPLEMENTING, COVERING, OR REMOVAL OF DEVICES AS DIRECTED BY THE ENGINEER.

THE FOLLOWING GENERAL NOTES APPLY AT ALL TIMES FOR THE DURATION OF THE CONSTRUCTION PROJECT EXCEPT WHEN OTHERWISE NOTED IN THE PLAN OR DIRECTED BY THE ENGINEER.

TRAFFIC PATTERN ALTERATIONS

A) NOTIFY THE ENGINEER TWENTY ONE (21) CALENDAR DAYS PRIOR TO ANY TRAFFIC PATTERN ALTERATION.

SIGNING

B) PROVIDE PERMANENT SIGNING.

C) PROVIDE SIGNING AND DEVICES REQUIRED TO CLOSE THE ROAD ACCORDING TO THE ROADWAY STANDARD DRAWINGS AND TRAFFIC CONTROL PLANS.

PROVIDE SIGNING REQUIRED FOR THE OFF–SITE DETOUR ROUTE AS SHOWN IN THE TRAFFIC CONTROL PLANS.

D) COVER OR REMOVE ALL SIGNS AND DEVICES REQUIRED TO CLOSE THE ROAD WHEN ROAD CLOSURE IS NOT IN OPERATION.

COVER OR REMOVE ALL SIGNS REQUIRED FOR THE OFF–SITE DETOUR WHEN THE DETOUR IS NOT IN OPERATION.

E) ENSURE ALL NECESSARY SIGNING IS IN PLACE PRIOR TO ALTERING ANY TRAFFIC PATTERN.

TRAFFIC CONTROL DEVICES

F) PLACE TYPE III BARRICADES, WITH "ROAD CLOSED" SIGN R11–2 ATTACHED, OF SUFFICIENT LENGTH TO CLOSE ENTIRE ROADWAY.

PAVEMENT MARKINGS AND MARKERS

G) INSTALL PAVEMENT MARKINGS ON THE FINAL SURFACE.

PROJECT REFERENCE	SHEET NO.
17BP.7.R.103 – ROCKINGHAM 248	TMP–1

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 21102 ENGINEER JAMES TIMOTHY JOHNSON

Digitally signed by JAMES TIMOTHY JOHNSON
4/14/2017

MOTT MACDONALD I & E, LLC
LICENSE NO. F–0669

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared in the Office of:
MOTT MACDONALD
PO Box 700
Fuquay–Varina, NC 27526
www.mottmac.com

PHASING

STEP 1: USING ROADWAY STANDARD DRAWING NUMBER 1101.03, SHEET 1 OF 9, AND SHEET TMP–2, PERFORM THE FOLLOWING:
– INSTALL ALL ROAD CLOSURE AND DETOUR SIGNING INCLUDING BARRICADES
– CLOSE SR 2009 (CAMP DAN VALLEY ROAD)
– PLACE TRAFFIC ONTO OFF– SITE DETOUR

STEP 2: REMOVE EXISTING BRIDGE #248 AND CONSTRUCT THE PROPOSED CULVERT AND APPROACHES AS SHOWN IN THE CONSTRUCTION PLANS.

STEP 3: INSTALL FINAL PAVEMENT MARKINGS.

STEP 4: REMOVE ALL TRAFFIC CONTROL SIGNING AND DEVICES AND RE–OPEN SR 2009 (CAMP DAN VALLEY ROAD) TO THE FINAL TRAFFIC PATTERN.

PAVEMENT MARKING

PAINT WHITE EDGELINE (4")	1,800 LF
PAINT YELLOW DOUBLE CENTER (4")	1,800 LF

NOTE: QUANTITY INCLUDES 2 APPLICATIONS OF EACH

PROJECT REFERENCE	SHEET NO.
17BP.7.R.103 – ROCKINGHAM 248	TMP–2

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 21102 ENGINEER JAMES TIMOTHY JORDAN

DocuSigned by:
James Timothy Jordan
4/14/2017

MOTT MACDONALD I & E, LLC
LICENSE NO. F-0669

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Prepared in the Office of:
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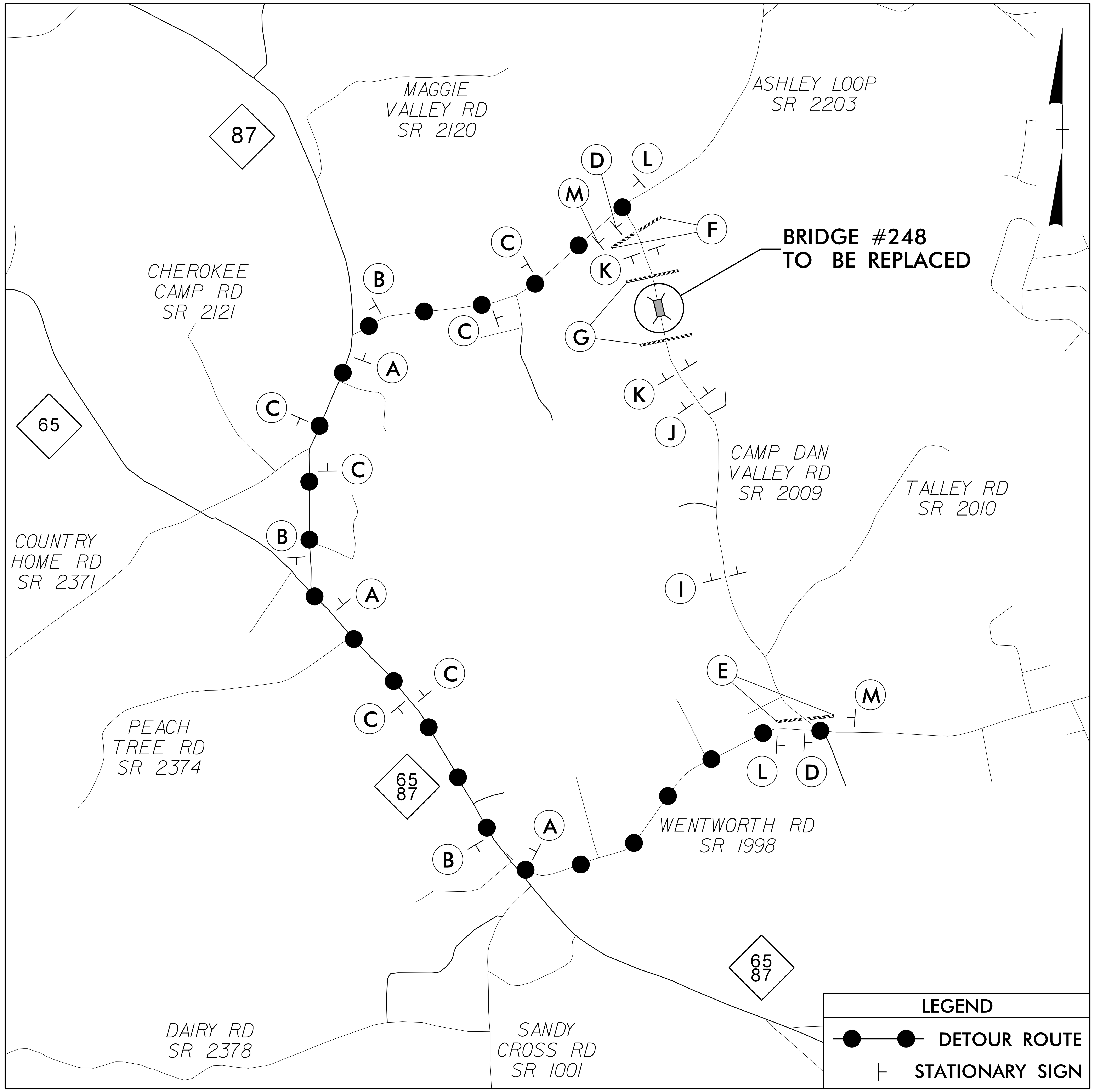
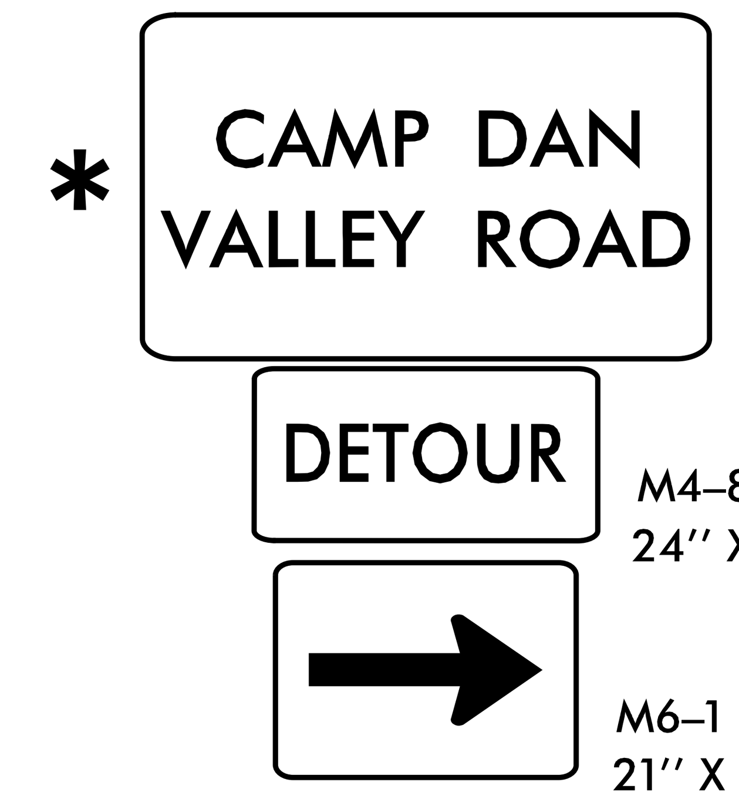
PO Box 700
Fuquay–Varina, NC 27526
www.mottmac.com



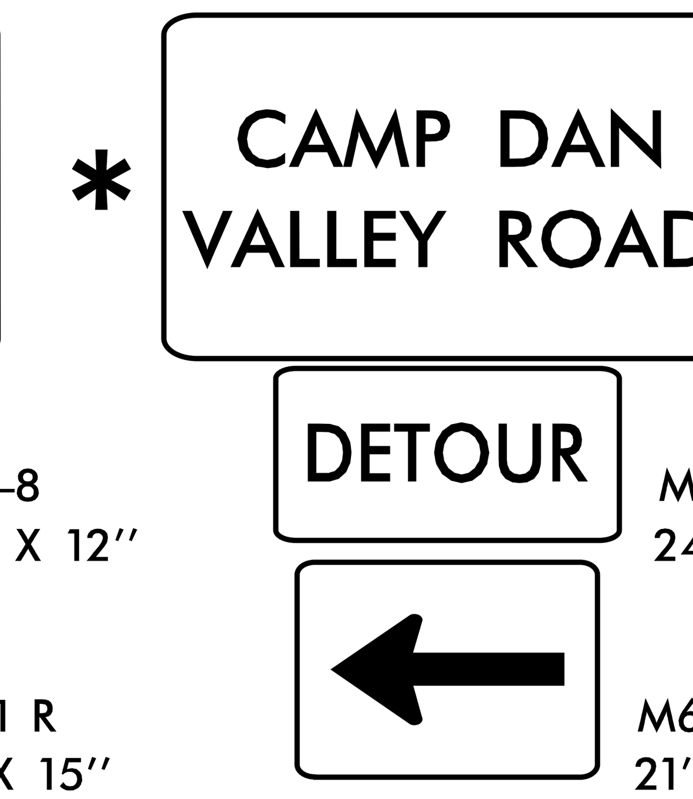
✱ SEE SHEET TMP–3 FOR SPECIAL SIGN DESIGNS



M4–8 24″ X 12″

M6–1 R 21″ X 15″

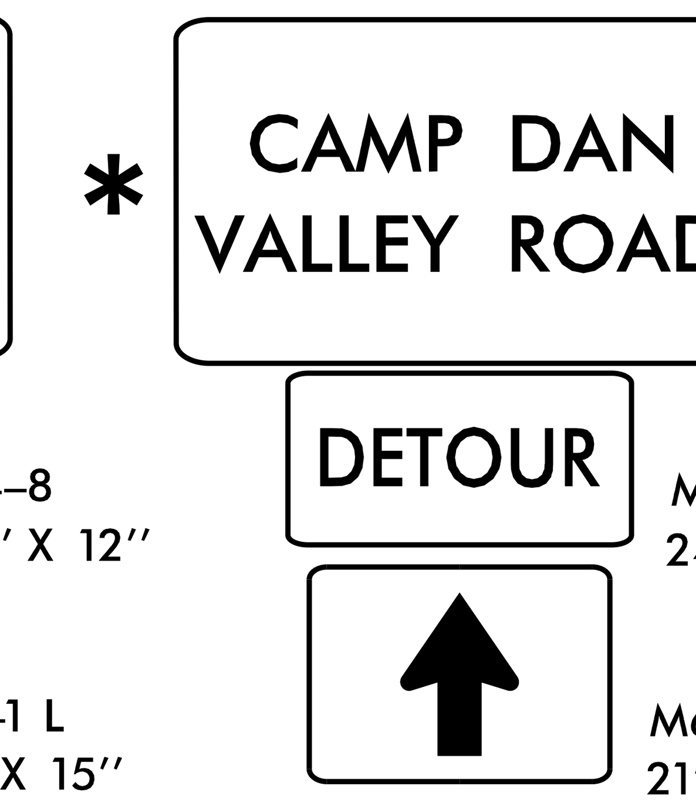
A



M4–8 24″ X 12″

M6–1 L 21″ X 15″

B



M4–8 24″ X 12″

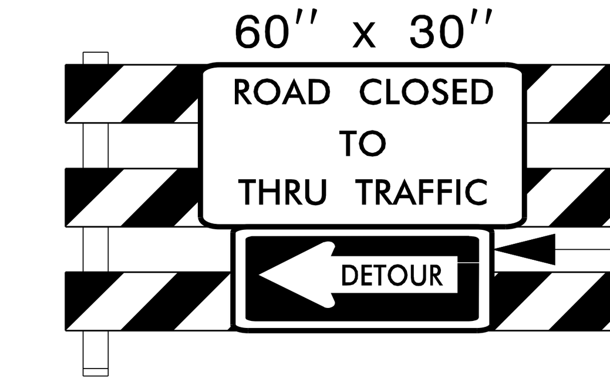
M6–3 21″ X 15″

C

M4–8 A 24″ X 18″

D

R11-4 60″ x 30″

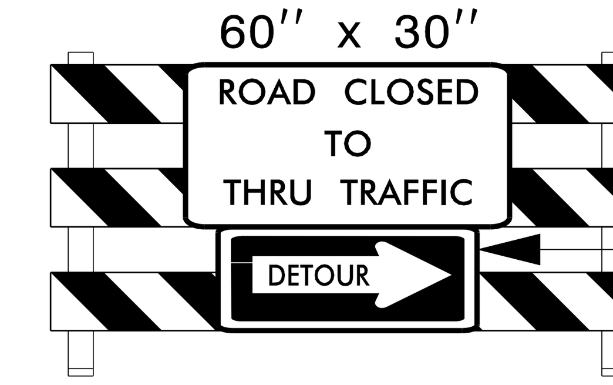


M4-10L 48″ x 18″

TYPE III BARRICADE

E

R11-4 60″ x 30″

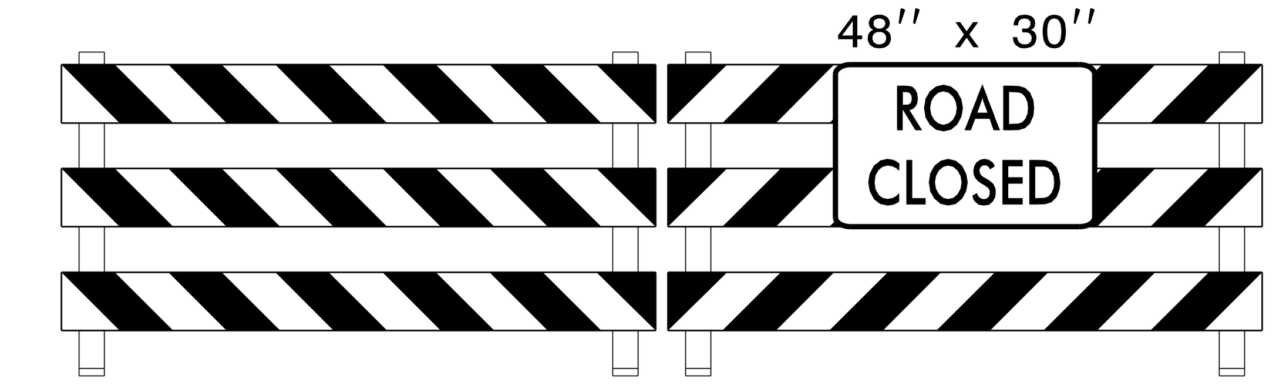


M4-10R 48″ x 18″

TYPE III BARRICADE

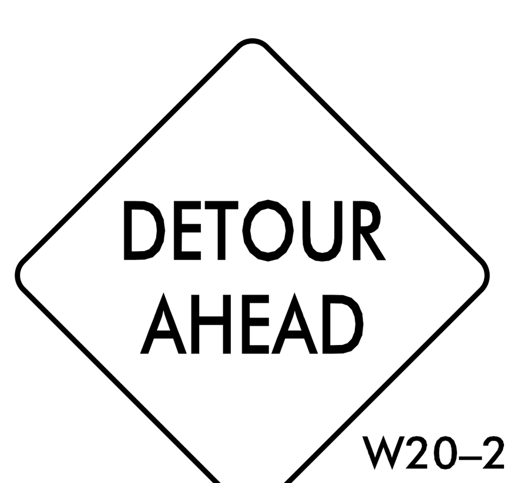
F

R11-2 48″ x 30″



TYPE III BARRICADE(S)

G

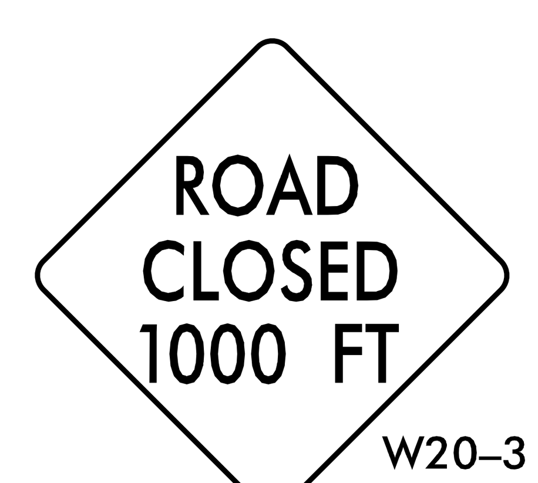


W20–2 48″ X 48″

NOT USED H

W20–3 48″ X 48″

I



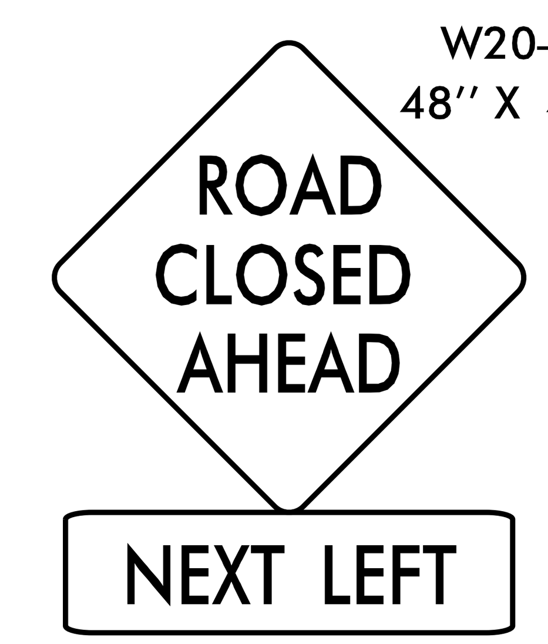
W20–3 48″ X 48″

J

W20–3 48″ X 48″

K

W20–3 48″ X 48″



SP–4L 42″ X 12″

L

W20–3 48″ X 48″

SP–4R 42″ X 12″

M

jor66165
R:\Roadway\Proj\780248_rdy_tmp.dgn
4/14/2017 8:14:16 AM

PROJECT REFERENCE	SHEET NO.
17BP.7.R.103 – ROCKINGHAM 248	TMP–3

TRAFFIC ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 023488 ENGINEER NATHAN K. PHILLIPS

Digitally signed by Nathan K. Phillips
4/14/2017

MOTT MACDONALD I & E, LLC
LICENSE NO. F-0669

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared in the Office of:
MOTT MACDONALD
PO Box 700
Fuquay–Varina, NC 27526
www.mottmac.com

SIGN NUMBER: SD-1
TYPE: D
QUANTITY: SEE PLANS

SIGN WIDTH: 5′-0″
HEIGHT: 2′-6″
TOTAL AREA: 12.5 Sq.Ft.

BORDER TYPE: INSET
RECESS: 0.38″
WIDTH: 0.5″
RADII: 1.5″

NO. Z BARS:
LENGTH:

BACKG COLOR: Fluorescent Orange
COPY COLOR: Black

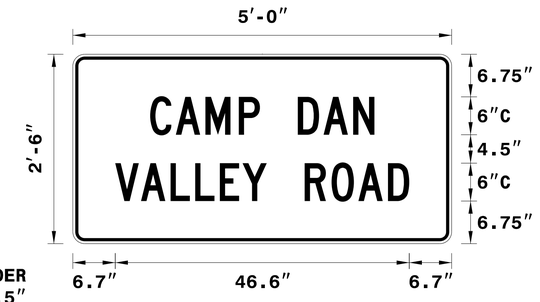
SYMBOL	X	Y	WID	HT

MAT′L: 0.125″ (3.2 mm) ALUMINUM

USE NOTES: 1,2

1. Legend and border shall be direct applied black non-reflective sheeting.
2. Background shall be NC GRADE B fluoresent orange retroreflective sheeting.

DESIGN BY: PJ
PROJECT ID: 17BP.7.R.103
CHECKED BY: NKP
DIV: 7
DATE: Oct 20, 2015



BORDER
R=1.5″
TH=0.5″
IN=0.38″

Spacing Factor is 1 unless specified otherwise

LETTER POSITIONS

Letter locations are panel edge to lower left corner

																											Series/Size Text Length
	C	A	M	P		D	A	N																			C 2000
	12.2	16.3	21	26.3	29.6	35.6	39.7	44.4																			35.5
	V	A	L	L	E	Y		R	O	A	D																C 2000
	6.7	10.8	15.5	19.4	23.3	26.9	30.7	36.7	41	45.2	49.9																46.6

FILENAME: 780248_rdy_tmp3

NORTH CAROLINA D.O.T. SIGN DETAIL

TIP PROJECT: 17BP.7.R.103

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17BP.7.R.103	EC-1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION

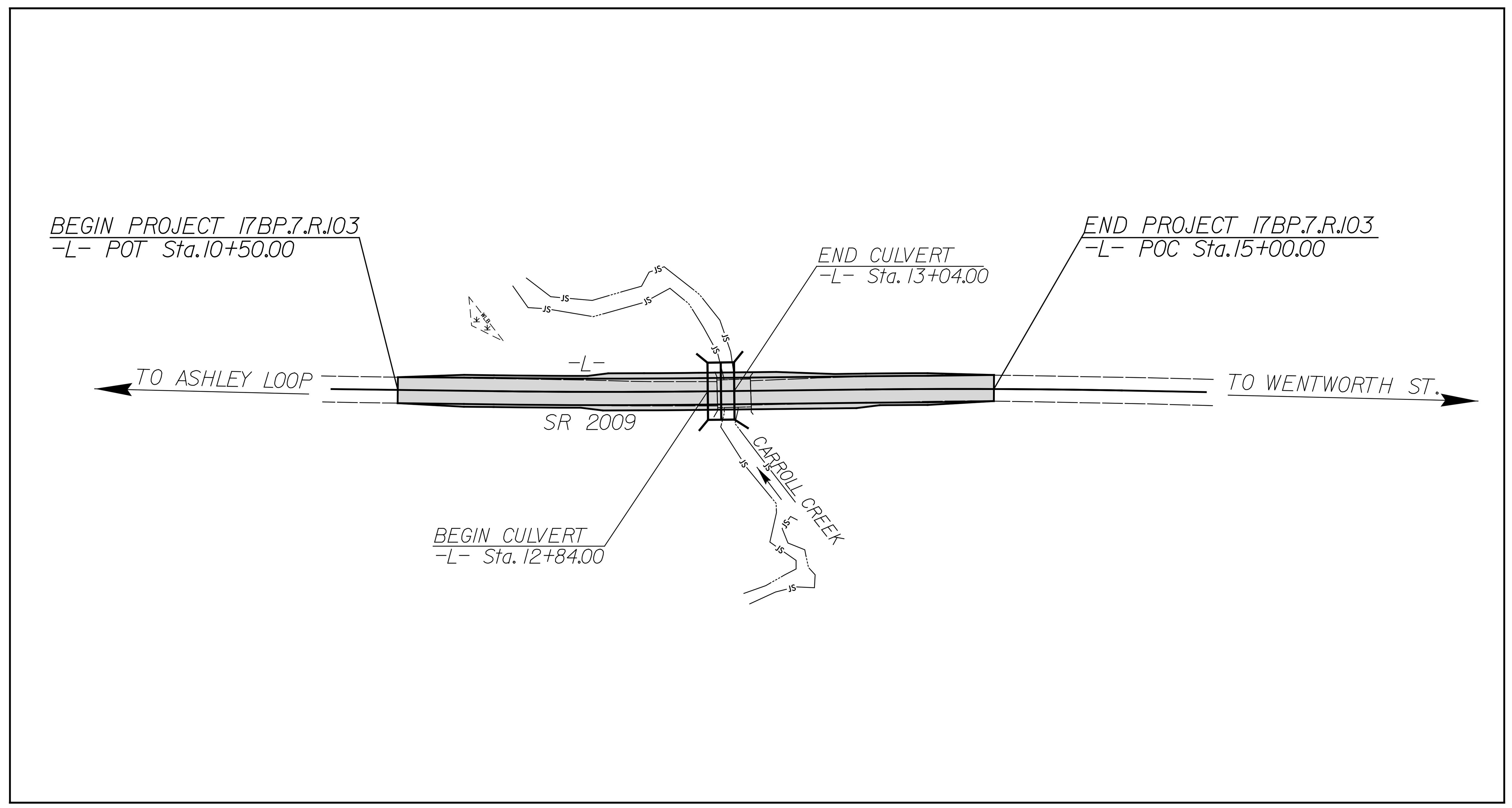
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PLAN FOR PROPOSED
HIGHWAY EROSION CONTROL

ROCKINGHAM COUNTY

LOCATION: BRIDGE NO. 248 OVER CARROLL CREEK ON SR 2009 (CAMP DAN VALLEY ROAD)

TYPE OF WORK: GRADING, PAVING, DRAINAGE AND CULVERT



EROSION AND SEDIMENT CONTROL MEASURES

Std. #	Description	Symbol
1630.03	Temporary Silt Ditch	TSD
1630.05	Temporary Diversion	TD
1605.01	Temporary Silt Fence	
1606.01	Special Sediment Control Fence	
1622.01	Temporary Berms and Slope Drains	
1630.02	Silt Basin Type B	
1633.01	Temporary Rock Silt Check Type-A	
	Temporary Rock Silt Check Type-A with Matting and Polyacrylamide (PAM)	
1633.02	Temporary Rock Silt Check Type-B	
	Wattle / Coir Fiber Wattle	EW / CFW
	Wattle / Coir Fiber Wattle with Polyacrylamide (PAM)	
1634.01	Temporary Rock Sediment Dam Type-A	
1634.02	Temporary Rock Sediment Dam Type-B	
1635.01	Rock Pipe Inlet Sediment Trap Type-A	
1635.02	Rock Pipe Inlet Sediment Trap Type-B	
1630.04	Stilling Basin	
1630.06	Special Stilling Basin	
	Rock Inlet Sediment Trap:	
1632.01	Type A	A
1632.02	Type B	B
1632.03	Type C	C
	Skimmer Basin	
	Tiered Skimmer Basin	
	Infiltration Basin	

THIS PROJECT CONTAINS EROSION CONTROL PLANS FOR CLEARING AND GRUBBING PHASE OF CONSTRUCTION.

NAD 83/NA 2011

ICA Engineering
5121 Kingdom Way, Suite 100
Raleigh, NC 27607
NC License No. F-0258

GRAPHIC SCALE

50
PLANS

50
PROFILE (HORIZONTAL)

10
PROFILE (VERTICAL)

THESE EROSION AND SEDIMENT CONTROL PLANS COMPLY WITH THE REGULATIONS SET FORTH BY THE NCG-010000 GENERAL CONSTRUCTION PERMIT EFFECTIVE AUGUST 1, 2016 AND ISSUED BY THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES DIVISION OF WATER RESOURCES.

Prepared In the Office of:

ICA ENGINEERING

5121 KINGDOM WAY, SUITE 100
RALEIGH NC 27607
NC License No. F-0258

Designed by:

STACEY H. BAILEY, PE — 3074
NAME — LEVEL III CERTIFICATION NO.

Reviewed In the Office of:

ROADSIDE ENVIRONMENTAL UNIT

1 South Wilmington St.
Raleigh, NC 27611

2012 STANDARD SPECIFICATIONS

Reviewed by:

JEFF WALSTON, PE, CPESC, CPSWQ

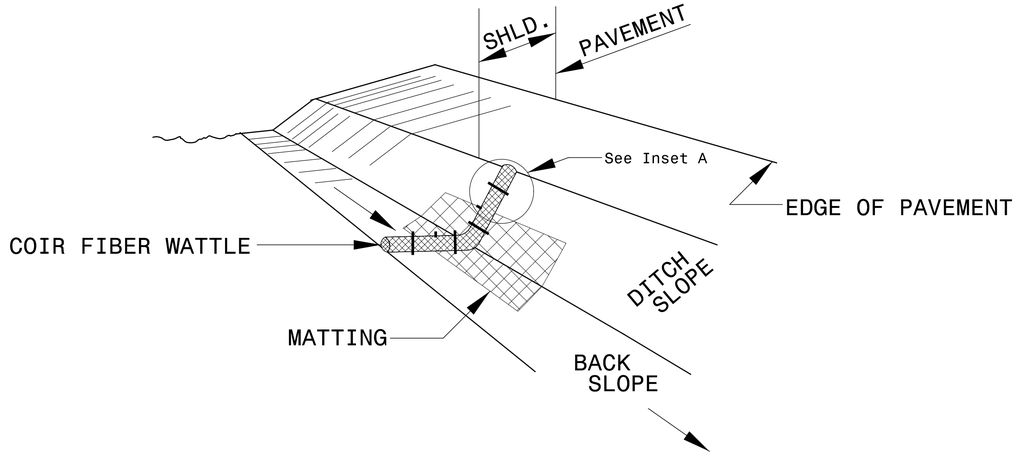
Roadway Standard Drawings

The following roadway english standards as appear in "Roadway Standard Drawings"– Roadway Design Unit – N. C. Department of Transportation – Raleigh, N. C., dated January 2012 and the latest revison thereto are applicable to this project and by reference hereby are considered a part of these plans.

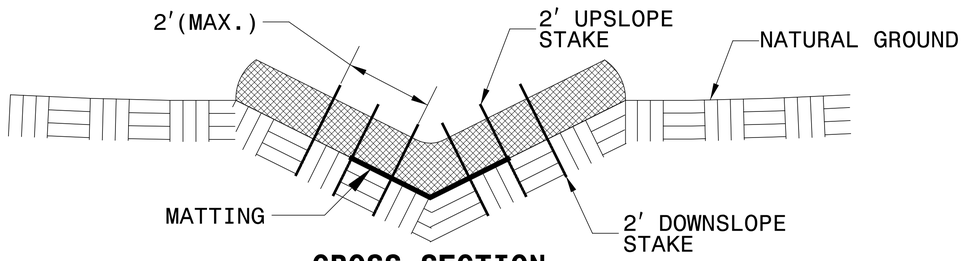
1604.01	Railroad Erosion Control Detail	1632.01	Rock Inlet Sediment Trap Type A
1605.01	Temporary Silt Fence	1632.02	Rock Inlet Sediment Trap Type B
1606.01	Special Sediment Control Fence	1632.03	Rock Inlet Sediment Trap Type C
1607.01	Gravel Construction Entrance	1633.01	Temporary Rock Silt Check Type A
1622.01	Temporary Berms and Slope Drains	1633.02	Temporary Rock Silt Check Type B
1630.01	Riser Basin	1634.01	Temporary Rock Sediment Dam Type A
1630.02	Silt Basin Type B	1634.02	Temporary Rock Sediment Dam Type B
1630.03	Temporary Silt Ditch	1635.01	Rock Pipe Inlet Sediment Trap Type A
1630.04	Stilling Basin	1635.02	Rock Pipe Inlet Sediment Trap Type B
1630.05	Temporary Diversion	1640.01	Coir Fiber Baffle
1630.06	Special Stilling Basin	1645.01	Temporary Stream Crossing
1631.01	Matting Installation		

PROJECT REFERENCE NO.	SHEET NO.
17BP.7.R.103	EC-2

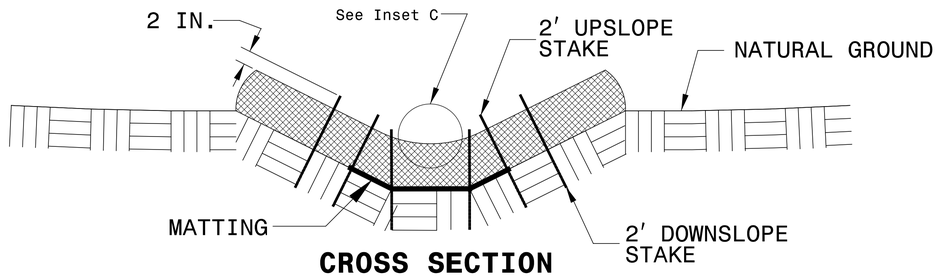
COIR FIBER WATTLE WITH POLYACRYLAMIDE (PAM) DETAIL



ISOMETRIC VIEW



CROSS SECTION VEE DITCH



CROSS SECTION TRAPEZOIDAL DITCH

NOTES:

USE MINIMUM 12 IN. DIAMETER COIR FIBER (COCONUT FIBER) WATTLE.

USE 2 FT. WOODEN STAKES WITH A 2 IN. BY 2 IN. NOMINAL CROSS SECTION.

ONLY INSTALL WATTLE(S) TO A HEIGHT IN DITCH SO FLOW WILL NOT WASH AROUND WATTLE AND SCOUR DITCH SLOPES AND AS DIRECTED.

INSTALL A MINIMUM OF 2 UPSLOPE STAKES AND 4 DOWNSLOPE STAKES AT AN ANGLE TO WEDGE WATTLE TO BOTTOM OF DITCH.

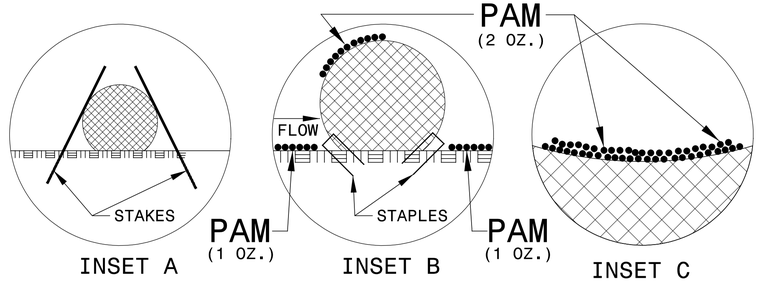
PROVIDE STAPLES MADE OF 0.125 IN. DIAMETER STEEL WIRE FORMED INTO A U SHAPE NOT LESS THAN 12″ IN LENGTH.

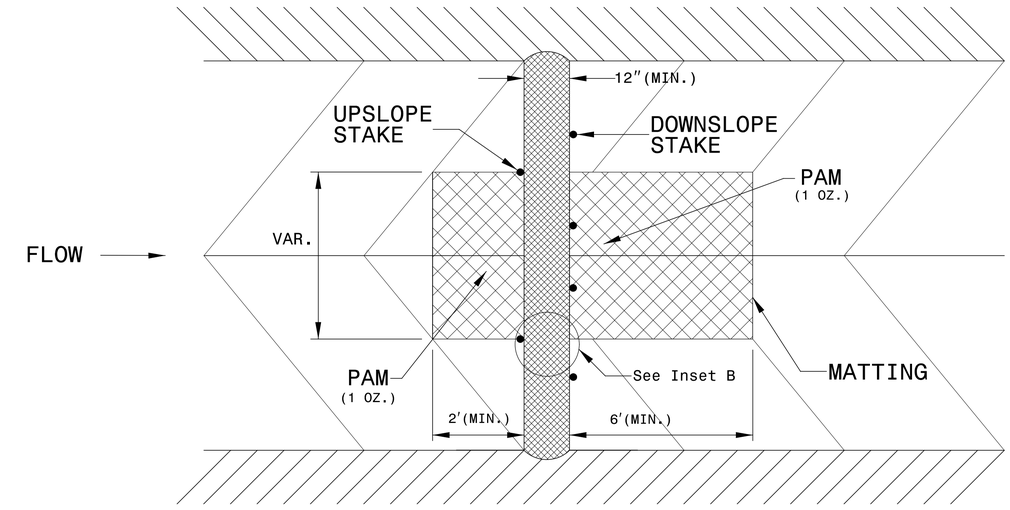
INSTALL STAPLES APPROXIMATELY EVERY 1 LINEAR FOOT ON BOTH SIDES OF WATTLE AND AT EACH END TO SECURE IT TO THE SOIL.

INSTALL MATTING IN ACCORDANCE WITH SECTION 1631 OF THE STANDARD SPECIFICATIONS.

PRIOR TO POLYACRYLAMIDE (PAM) APPLICATION, OBTAIN A SOIL SAMPLE FROM PROJECT LOCATION, AND FROM OFFSITE MATERIAL, AND ANALYZE FOR APPROPRIATE PAM FLOCCULANT TO BE APPLIED TO EACH WATTLE.

INITIALLY APPLY 2 OUNCES OF ANIONIC OR NEUTRALLY CHARGED PAM OVER WATTLE WHERE WATER WILL FLOW AND 1 OUNCE OF PAM ON MATTING ON EACH SIDE OF WATTLE. REAPPLY PAM AFTER EVERY RAINFALL EVENT THAT IS EQUAL TO OR EXCEEDS 0.50 IN.





TOP VIEW

PROJECT REFERENCE NO.	SHEET NO.
17BP.7.R.103	EC-3

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

SOIL STABILIZATION TIMEFRAMES

SITE DESCRIPTION	STABILIZATION TIME	TIMEFRAME EXCEPTIONS
PERIMETER DIKES, SWALES, DITCHES AND SLOPES	7 DAYS	NONE
HIGH QUALITY WATER (HQW) ZONES	7 DAYS	NONE
SLOPES STEEPER THAN 3:1	7 DAYS	IF SLOPES ARE 10' OR LESS IN LENGTH AND ARE NOT STEEPER THAN 2:1, 14 DAYS ARE ALLOWED.
SLOPES 3:1 OR FLATTER	14 DAYS	7 DAYS FOR SLOPES GREATER THAN 50' IN LENGTH.
ALL OTHER AREAS WITH SLOPES FLATTER THAN 4:1	14 DAYS	NONE, EXCEPT FOR PERIMETERS AND HQW ZONES.

PROJECT REFERENCE	SHEET NO.
17BP.7.R.103 – ROCKINGHAM 248	EC-04/CONST.04

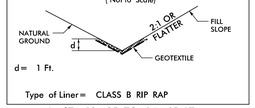
LEVEL III CERTIFIED BY:
STACEY H. BAILEY, PE
CERTIFICATION NUMBER: 3074
ISSUED: MARCH 14, 2017

ICA Engineering
5121 Kingdom Way, Suite 100
Raleigh, NC 27607
NC License No: P-0258

CLEARING AND GRUBBING
EROSION CONTROL FOR
CONSTRUCTION SHEET 04

GRAPHIC SCALE
50 0 50 100

DETAIL A
TOE PROTECTION
(Not to Scale)

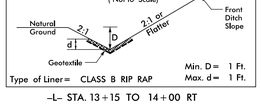


d = 1 Ft.

Type of Liner = CLASS B RIP RAP

–L– STA. 13+85 TO 14+65 LT

DETAIL B
SPECIAL CUT DITCH
(Not to Scale)

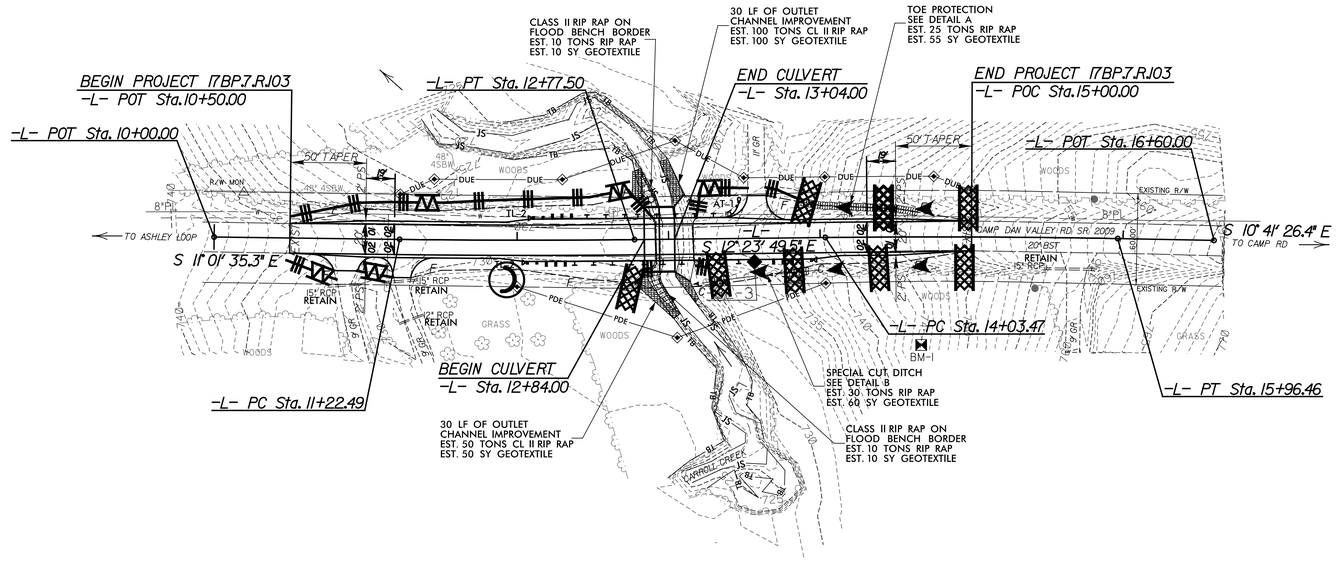


Type of Liner = CLASS B RIP RAP
Min. D = 1 Ft.
Max. d = 1 Ft.

–L– STA. 13+15 TO 14+00 RT

NAD 83/NA 2011

15+00



NOTE:
PLACE TEMPORARY ROCK SEDIMENT DAMS TYPE – B AND TEMPORARY ROCK SILT CHECKS TYPE – A AT DRAINAGE OUTLETS.

NOTE:
PERIMETER EROSION CONTROL MEASURES SHALL BE INSTALLED DURING CLEARING AND GRUBBING PHASE.

NOTE:
ALL EROSION CONTROL DEVICES SHOWN ARE LOCATED WITHIN EXISTING R/W OR EASEMENT.

ICA ENGINEERING, INC.
R:\Hydraulics\Erosion Control\cadd\780248_hyd_erosion_c&g_psh04.dgn
$$DATE$$ 4/17/2017

PROJECT REFERENCE NO.	SHEET NO.
17BP.7.R.103	EC-4A/CONST.4
R/W SHEET NO.	

BRIDGE NO. 248 OVER CARROLL CREEK ON SR 2009 (CAMP DAN VALLEY ROAD) ROCKINGHAM COUNTY, NC

GRAPHIC SCALE: 30 0 30 60

CONSTRUCTION SEQUENCE

CULVERT PHASING
SF-780248

PHASE 1

1.) INSTALL ALL TEMPORARY SEDIMENT CONTROL DEVICES NECESSARY FOR CULVERT CONSTRUCTION.

2.) INSTALL SPECIAL STILLING BASIN WITHIN PROJECT RIGHT-OF-WAY. PUMP ALL EFFLUENT INTO SPECIAL STILLING BASIN.

3.) INSTALL IMPERVIOUS DIKES AND INSTALL 24" TEMP. PIPE.

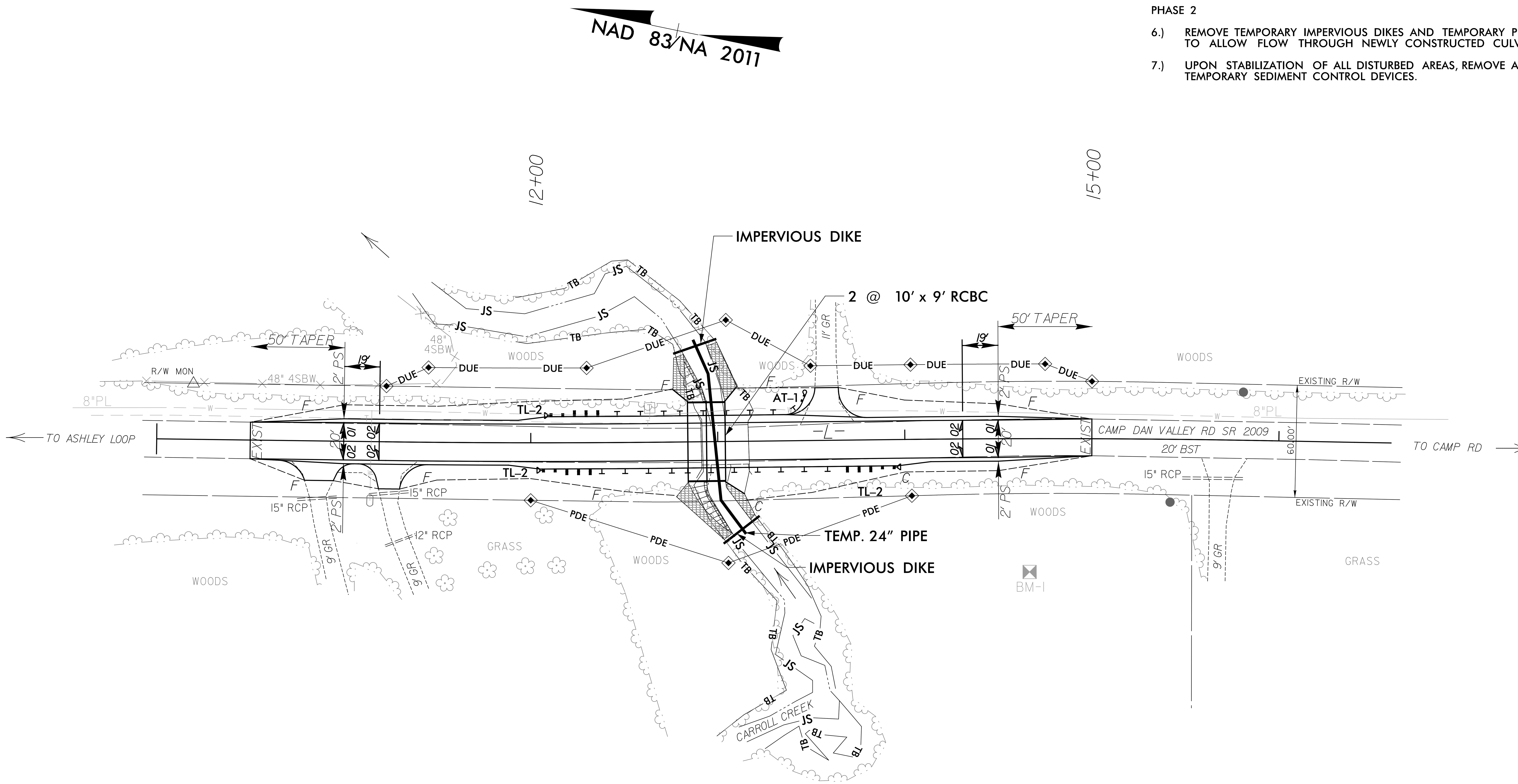
4.) DE-WATER EFFLUENT FROM WORK SITE INTO SPECIAL STILLING BASIN.

5.) CONSTRUCT PROPOSED 2 @ 10'x9' RCBC CHANNEL IMPROVEMENTS AND FLOOD BENCH PER PLANS.

PHASE 2

6.) REMOVE TEMPORARY IMPERVIOUS DIKES AND TEMPORARY PIPE TO ALLOW FLOW THROUGH NEWLY CONSTRUCTED CULVERT.

7.) UPON STABILIZATION OF ALL DISTURBED AREAS, REMOVE ALL TEMPORARY SEDIMENT CONTROL DEVICES.



PROJECT REFERENCE	SHEET NO.
17BP.7.R.103 – ROCKINGHAM 248	EC-05/CONST.04

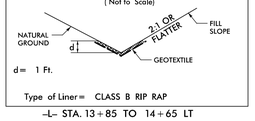
LEVEL III CERTIFIED BY:
STACEY H. BAILEY, PE
CERTIFICATION NUMBER: 3074
ISSUED: MARCH 14, 2017

ICA Engineering
5121 Kingdom Way, Suite 100
Raleigh, NC 27607
NC License No: P-0258

FINAL EROSION CONTROL FOR CONSTRUCTION
SHEET 04

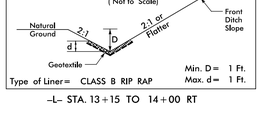
GRAPHIC SCALE
50 0 50 100

DETAIL A
TOE PROTECTION
(Not to Scale)



d = 1 Ft.
Type of Liner = CLASS B RIP RAP
–L– STA. 13+85 TO 14+65 LT

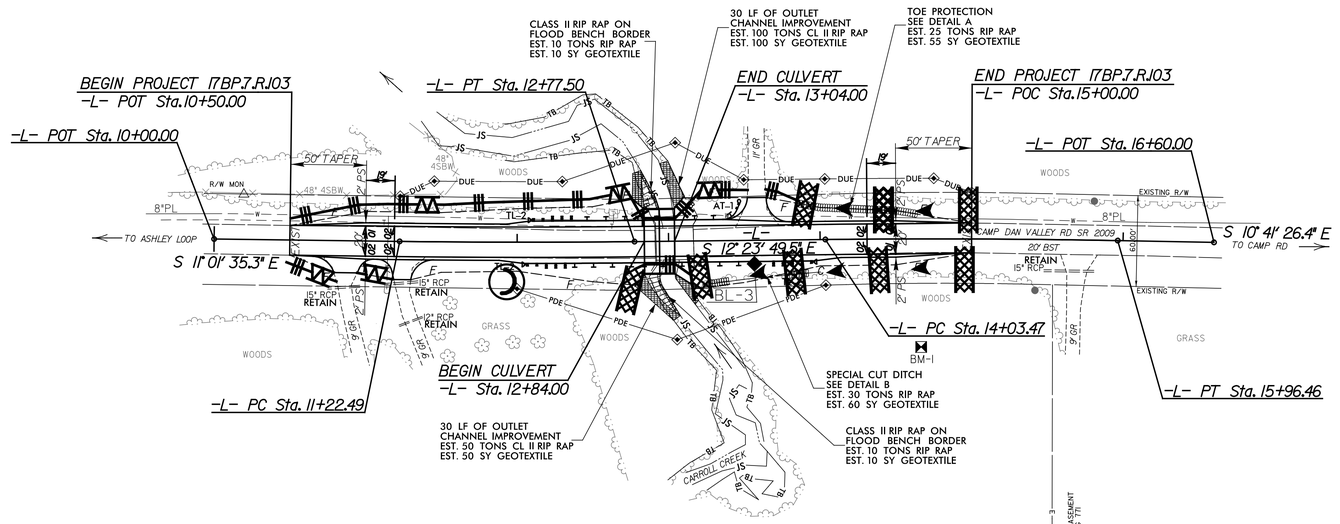
DETAIL B
SPECIAL CUT DITCH
(Not to Scale)



Min. D = 1 Ft.
Max. d = 1 Ft.
Type of Liner = CLASS B RIP RAP
–L– STA. 13+15 TO 14+00 RT

NAD 83/NA 2011

15+00



09/08/99

TIP PROJECT: 17BP.7.R.103

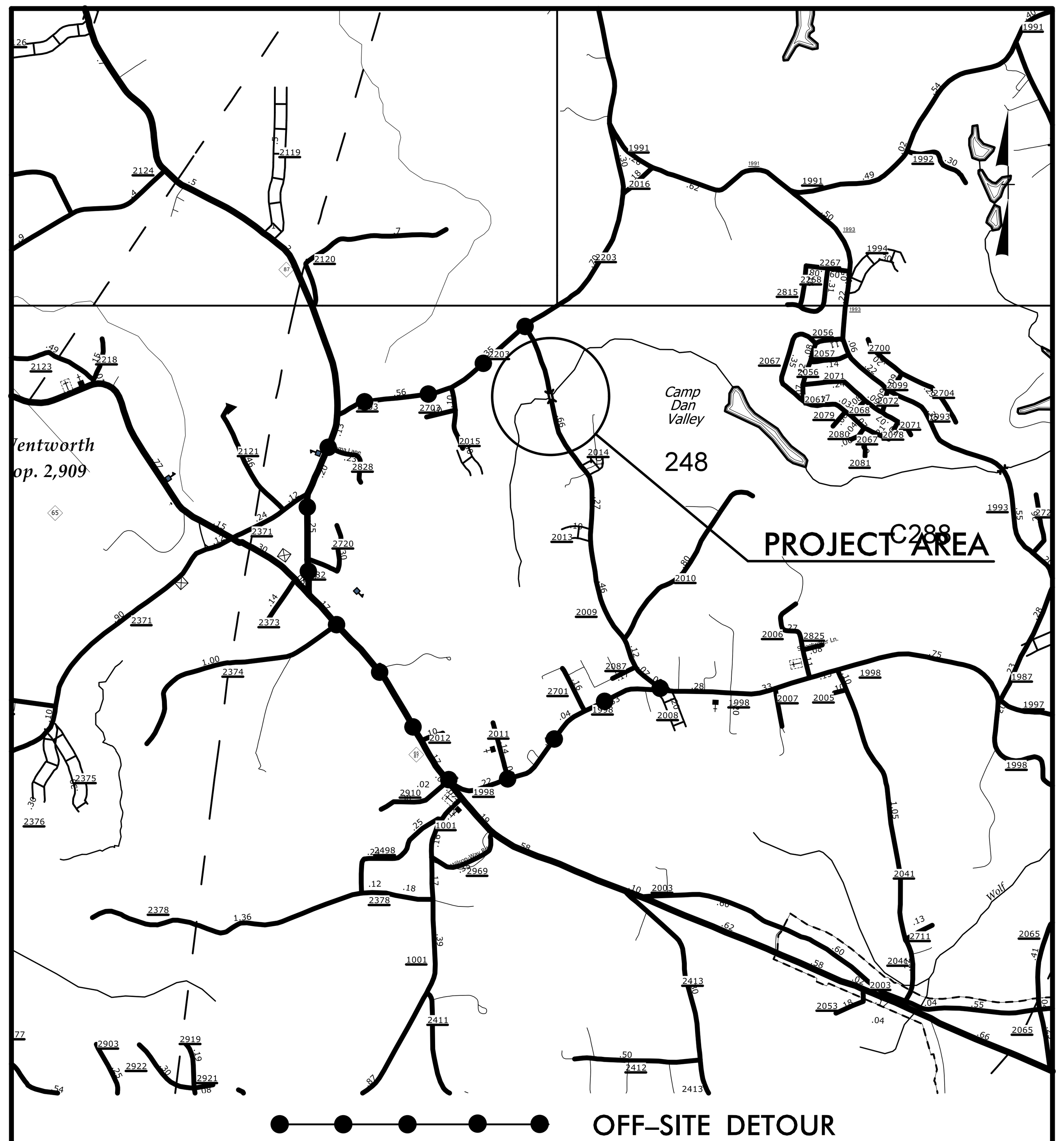
T.I.P. NO.	SHEET NO.
17BP.7.R.103	UC–1

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

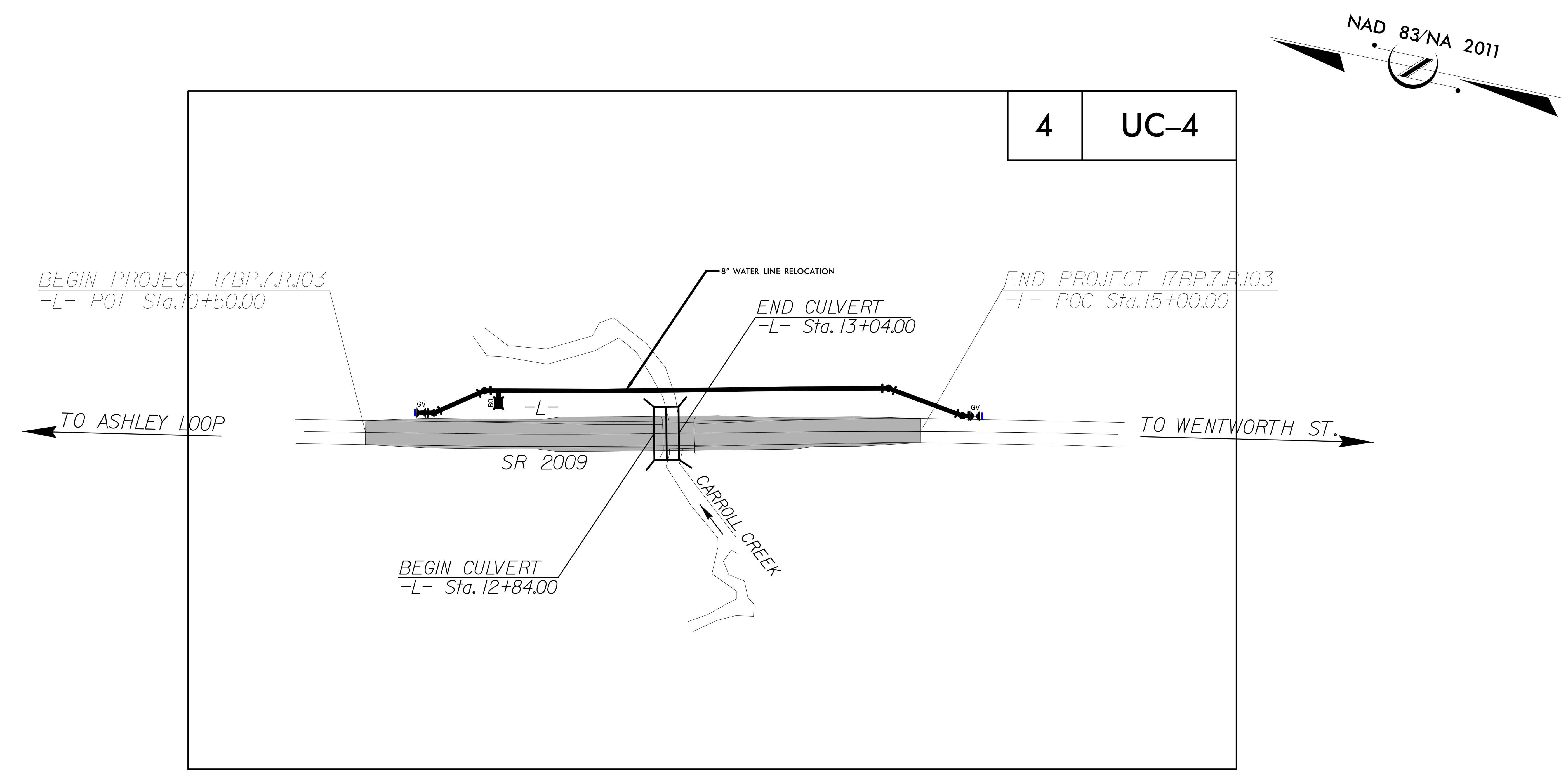
UTILITY CONSTRUCTION PLANS
ROCKINGHAM COUNTY

LOCATION: BRIDGE NO. 248 CARROLL CREEK ON SR 2009 (CAMP DAN VALLEY ROAD)

TYPE OF WORK: UTILITY RELOCATION OF WATER MAIN



VICINITY MAP



DOCUMENT NOT CONSIDERED FINAL UNTIL ALL SIGNATURES ARE COMPLETED

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

INDEX OF SHEETS

WATER AND SEWER OWNERS ON PROJECT

(A) WATER – DAN RIVER WATER, INC.

PREPARED IN THE OFFICE OF

THE WOOTEN COMPANY
120 North Boylan Avenue Raleigh NC 27603-1423
919.828.0531 fax 919.834.3589
License Number: F-0115

James R. Gregg — CONSULTANT CONTACT #1
_______________ — CONSULTANT CONTACT #2
_______________ — CONSULTANT CONTACT #3

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 37878 ENGINEER JAMES R. GREGG
1/20/2017
DocuSigned by:
891D2BFD8...

DIVISION OF HIGHWAYS UTILITIES UNIT
1555 MAIL SERVICES CENTER
RALEIGH NC 27699–1555
PHONE (919) 707–6690
FAX (919) 250–4151

_______________ UTILITIES REGIONAL ENGINEER
_______________ UTILITIES ENGINEER
_______________ UTILITIES AREA COORDINATOR
_______________ UTILITIES COORDINATOR

$$$$SYSTIME$$$$ $$$$$$DGN$$$$$$$$$$$$$ $$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
17BP.7.R.103 – ROCKINGHAM 248	UC-2

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

UTILITIES PLAN SHEET SYMBOLS

PROPOSED WATER SYMBOLS

- Water Line (Sized as Shown) — 12" WL
- 11¼ Degree Bend
- 22½ Degree Bend
- 45 Degree Bend
- 90 Degree Bend
- Plug
- Tee
- Cross
- Reducer
- Gate Valve — GV
- Butterfly Valve — BV
- Tapping Valve — TGV
- Line Stop — LS
- Line Stop with Bypass — LS/BP
- Blow Off — BO
- Fire Hydrant — PFH
- Relocate Fire Hydrant — REH
- Remove Fire Hydrant — REM FH
- Water Meter — PWM
- Relocate Water Meter — RWM
- Remove Water Meter — REM WM
- Water Pump Station — PS(W)
- RPZ Backflow Preventer — PRPZ
- DCV Backflow Preventer — PBFP
- Relocate RPZ Backflow Preventer — RRPZ
- Relocate DCV Backflow Preventer — RBFP

PROPOSED SEWER SYMBOLS

- Gravity Sewer Line (Sized as Shown) — 12" SS
- Force Main Sewer Line (Sized as Shown) — 12" FSS
- Manhole (Sized per Note)
- Sewer Pump Station — PS(SS)

PROPOSED MISCELLANOUS UTILITIES SYMBOLS

- Power Pole
- Telephone Pole
- Joint Use Pole
- Telephone Pedestal — TEL_PED
- Utility Line by Others (Type as Shown) — PROP O/H POW LINES
- Trenchless Installation — 12" TL INSTALL
- Encasement by Open Cut — 24" ENCAS BY OC
- Encasement — 24" ENCASEMENT
- Thrust Block
- Air Release Valve — AR
- Utility Vault — UV
- Concrete Pier — CP
- Steel Pier — SP
- Plan Note — NOTE
- Pay Item Note — PAY ITEM

EXISTING UTILITIES SYMBOLS

- Power Pole
- Telephone Pole
- Joint Use Pole
- Utility Pole
- Utility Pole with Base
- H-Frame Pole
- Power Transmission Line Tower
- Water Manhole
- Power Manhole
- Telephone Manhole
- Sanitary Sewer Manhole
- Hand Hole for Cable
- Power Transformer
- Telephone Pedestal
- CATV Pedestal
- Gas Valve
- Gas Meter
- Located Miscellaneous Utility Object
- Abandoned According to Utility Records — AATUR
- End of Information — E.O.I.
- *Underground Power Line — P
- *Underground Telephone Cable — T
- *Underground Telephone Conduit — TC
- *Underground Fiber Optics Telephone Cable — T FO
- *Underground TV Cable — TV
- *Underground Fiber Optics TV Cable — TV FO
- *Underground Gas Pipeline — G
- Aboveground Gas Pipeline — A/G Gas
- *Underground Water Line — W
- Aboveground Water Line — A/G Water
- *Underground Gravity Sanitary Sewer Line — SS
- Aboveground Gravity Sanitary Sewer Line — A/G Sanitary Sewer
- *Underground SS Forced Main Line — FSS
- Underground Unknown Utility Line — ?UTL
- SUE Test Hole
- Water Meter
- Water Valve
- Fire Hydrant
- Sanitary Sewer Cleanout

*For Existing Utilities

- Utility Line Drawn from Record (Type as Shown) — W
- Designated Utility Line (Type as Shown) — W

REVISIONS

8/17/93

$$DATE$$
$$SYSTIME$$
$$DGN$$
$$USERNAME$$

8/17/99

REVISIONS

UTILITY CONSTRUCTION

GENERAL NOTES:

1. THE PROPOSED UTILITY CONSTRUCTION SHALL MEET THE APPLICABLE REQUIREMENTS OF THE NC DEPARTMENT OF TRANSPORTATION'S "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" DATED JANUARY 2012.

2. THE EXISTING UTILITIES BELONG TO DAN RIVER WATER, INC .

3. ALL WATER LINES TO BE INSTALLED WITHIN COMPLIANCE OF THE RULES AND REGULATIONS OF THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENTAL AND NATURAL RESOURCES, DIVISION OF WATER RESOURCES, PUBLIC WATER SUPPLY SECTION.

4. THE UTILITY OWNER OWNS THE EXISTING UTILITY FACILITIES AND WILL OWN THE NEW UTILITY FACILITIES AFTER ACCEPTANCE BY THE DEPARTMENT. THE DEPARTMENT OWNS THE CONSTRUCTION CONTRACT AND HAS ADMINISTRATIVE AUTHORITY. COMMUNICATIONS AND DECISIONS BETWEEN THE CONTRACTOR AND UTILITY OWNER ARE NOT BINDING UPON THE DEPARTMENT OR THIS CONTRACT UNLESS AUTHORIZED BY THE ENGINEER. AGREEMENTS BETWEEN THE UTILITY OWNER AND CONTRACTOR FOR THE WORK THAT IS NOT PART OF THIS CONTRACT OR IS SECONDARY TO THIS CONTRACT ARE ALLOWED, BUT ARE NOT BINDING UPON THE DEPARTMENT.

5. PROVIDE ACCESS FOR THE DEPARTMENT PERSONNEL AND THE OWNER'S REPRESENTATIVES TO ALL PHASES OF CONSTRUCTION. NOTIFY DEPARTMENT PERSONNEL AND THE UTILITY OWNER TWO WEEKS PRIOR TO COMMENCEMENT OF ANY WORK AND ONE WEEK PRIOR TO SERVICE INTERRUPTION. KEEP UTILITY OWNERS' REPRESENTATIVES INFORMED OF WORK PROGRESS AND PROVIDE OPPROTUNITY FOR INSPECTION OF CONSTRUCTION AND TESTING.

6. THE PLANS DEPICT THE BEST AVAILABLE INFORMATION FOR THE LOCATION, SIZE, AND TYPE OF MATERIAL FOR ALL EXISTING UTILITIES. MAKE INVESTIGATIONS FOR DETERMINING THE EXACT LOCATION, SIZE, AND TYPE MATERIAL OF THE EXISTING FACILITIES AS NECESSARY FOR THE CONSTRUCTION OF THE PROPOSED UTILITIES AND FOR AVOIDING DAMAGE TO EXISTING FACILITIES. REPAIR ANY DAMAGE INCURRED TO EXISTING FACILITIES TO THE ORIGINAL OR BETTER CONDITION AT NO ADDITONAL COST TO THE DEPARTMENT.

7. MAKE FINAL CONNECTIONS OF THE NEW WORK TO THE EXISTING SYSTEM WHERE INDICATED ON THE PLANS, AS REQUIRED TO FIT THE ACTUAL CONDITIONS, OR AS DIRECTED.

8. MAKE CONNECTIONS BETWEEN EXISTING AND PROPOSED UTILITIES AT TIMES MOST CONVENIENT TO THE PUBLIC, WITHOUT ENDANGERING THE UTILITY SERVICE, AND IN ACCORDANCE WITH THE UTILITY OWNER'S REQUIREMENTS. MAKE CONNECTIONS ON WEEKENDS, AT NIGHT, AND ON HOLIDAYS IF NECESSARY.

9. ALL UTILITY MATERIALS SHALL BE APPROVED PRIOR TO DELIVERY TO THE PROJECT. SEE 1500-7, " SUBMITTALS AND RECORDS" IN SECTION 1500 OF THE STANDARD SPECIFICATIONS.

PROJECT SPECIFIC NOTES:

1. PROPOSED WATER LINE FROM -L- LINE STATION 11+05 TO -L- LINE STATION 12+43 AND FROM -L- LINE STATION 13+94 TO -L- LINE STATION 15+34 SHALL BE D.I.R.J. (DUCTILE IRON RESTRAINED JOINT) PIPE. PROPOSED WATER LINE FROM -L- LINE STATION 12+43 TO -L- LINE STATION 13+94 SHALL BE F.P.V.C. (FUSIBLE POLYVINYL CHLORIDE) PIPE.

2. CONTRACTOR'S ATTENTION IS DIRECTED TO SECTIONS 102, 107, AND 1550 OF THE STANDARD SPECIFICATIONS CONCERNING TRENCHLESS INSTALLATION. IT IS CONTRACTOR'S RESPONSIBILITY TO HAVE BORE DESIGNED AND SEALED BY A LICENSED NORTH CAROLINA PROFESSIONAL ENGINEER. NO DAMAGE IS ALLOWED TO RIVER, WETLANDS, OR BUFFER ZONES.

4. TRACER WIRE AND WARNING TAPE SHALL BE INSTALLED WITH ALL PLASTIC PIPE UTILITIES. WIRE, TAPE, AND PIPE SHALL BE COLOR CODED ACCORDING TO UTILITY (BLUE FOR WATER) AND SHALL BE IN ACCORDANCE WITH NCDOT SPECIFICATIONS.

5. FUSED PVC PIPE LENGTHS THAT HAVE BEEN INSTALLED IN THE TRENCH SHALL NOT BE BENT OR JOCKEYED INTO POSITION WITH HEAVY EQUIPMENT IN ORDER TO CONNECT TO FITTINGS. ALL ALIGNMENTS CORRECTIONS SHALL TAKE PLACE IN THE DIP FITTINGS.

PROJECT REFERENCE NO.	SHEET NO.
17BP.7.R.103 – ROCKINGHAM 248	UC-3

DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:
REVISED:

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
UTILITIES ENGINEERING SEC.
PHONE: (919) 707-6690
FAX: (919) 250-4151

NORTH CAROLINA PROFESSIONAL SEAL 37878 ENGINEER JAMES R. GREGG
4/20/2017
DocuSigned by: James Gregg

Document Not Considered Final Unless All Signatures Completed
UTILITY CONSTRUCTION PLANS ONLY

Prepared in the Office of:
THE WOOTEN COMPANY
120 North Boylan Avenue Raleigh NC 27603-1423
919.828.0531 fax 919.834.3589
License Number: F-0115

VERTICAL SCALE 5' 0 5' 10'
HORIZONTAL SCALE 25' 0 25' 50'

UTILITY CONSTRUCTION

$$$DATE$$$ $$$$$SYSTIME$$$$$ $$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$ $$$USERNAME$$$$

PROJECT TYPICAL DETAILS

PROJECT REFERENCE NO.	SHEET NO.
17BP.7.R.103 – ROCKINGHAM 248	UC-3A

DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:
REVISED:

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
UTILITIES ENGINEERING SEC.
PHONE: (919) 707-6690
FAX: (919) 250-4151

NORTH CAROLINA PROFESSIONAL SEAL 037878 ENGINEER JAMES R. GREGG 10/2017

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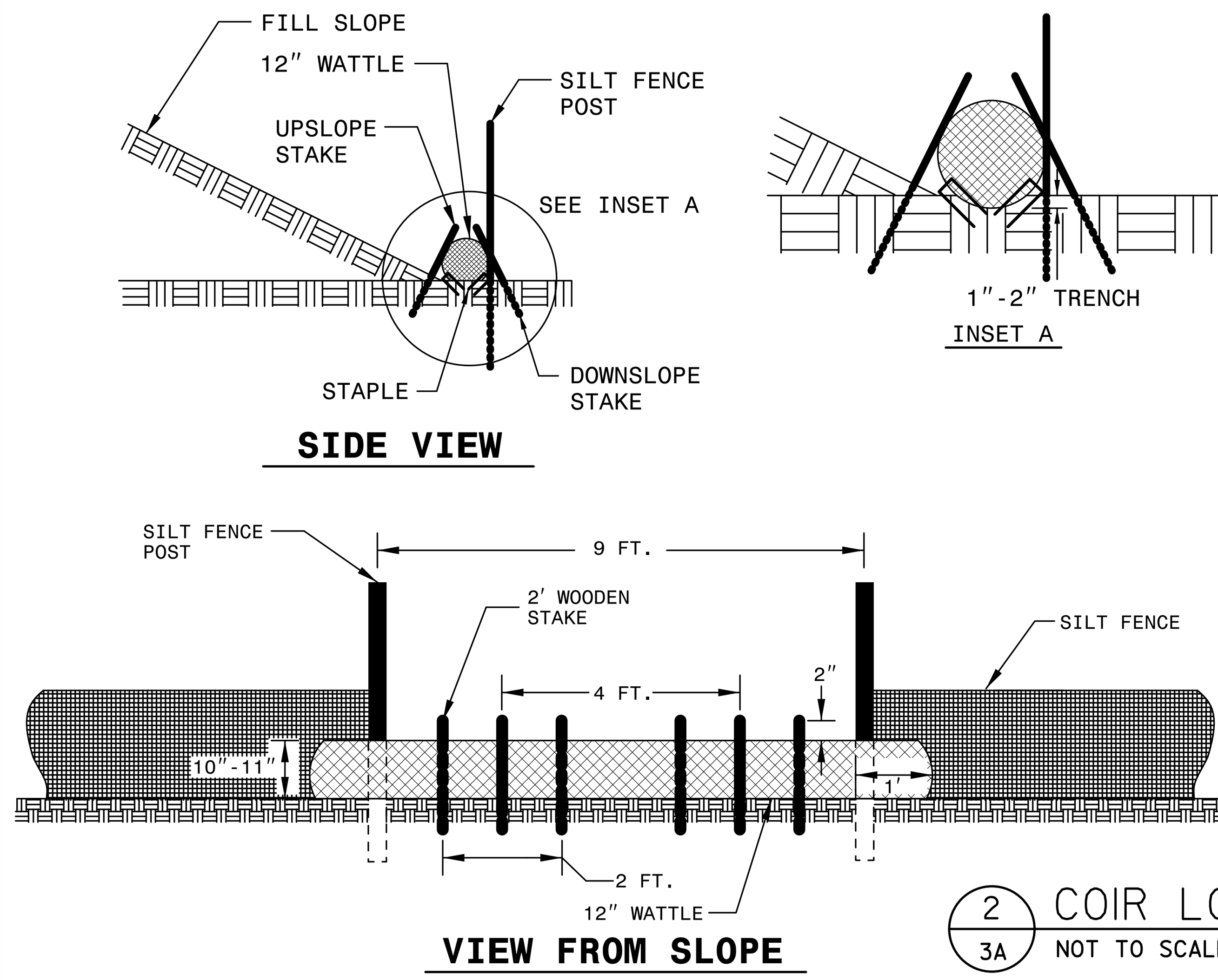
HORIZONTAL SCALE 25' 0 25' 50'

UTILITY CONSTRUCTION

REVISIONS

8/17/99

NCDOT STANDARD DETAILS:
1. 300.01 (SHEETS 1, 2, AND 3)



NOTES:

USE MINIMUM 12 IN. DIAMETER COIR FIBER (COCONUT FIBER) WATTLE AND LENGTH OF 10 FT.

EXCAVATE A 1 TO 2 INCH TRENCH FOR WATTLE TO BE PLACED.

DO NOT PLACE WATTLE ON TOE OF SLOPE.

USE 2 FT. WOODEN STAKES WITH A 2 IN. BY 2 IN. NOMINAL CROSS SECTION.

INSTALL A MINIMUM OF 2 UPSLOPE STAKES AND 4 DOWNSLOPE STAKES AT AN ANGLE TO WEDGE WATTLE TO GROUND.

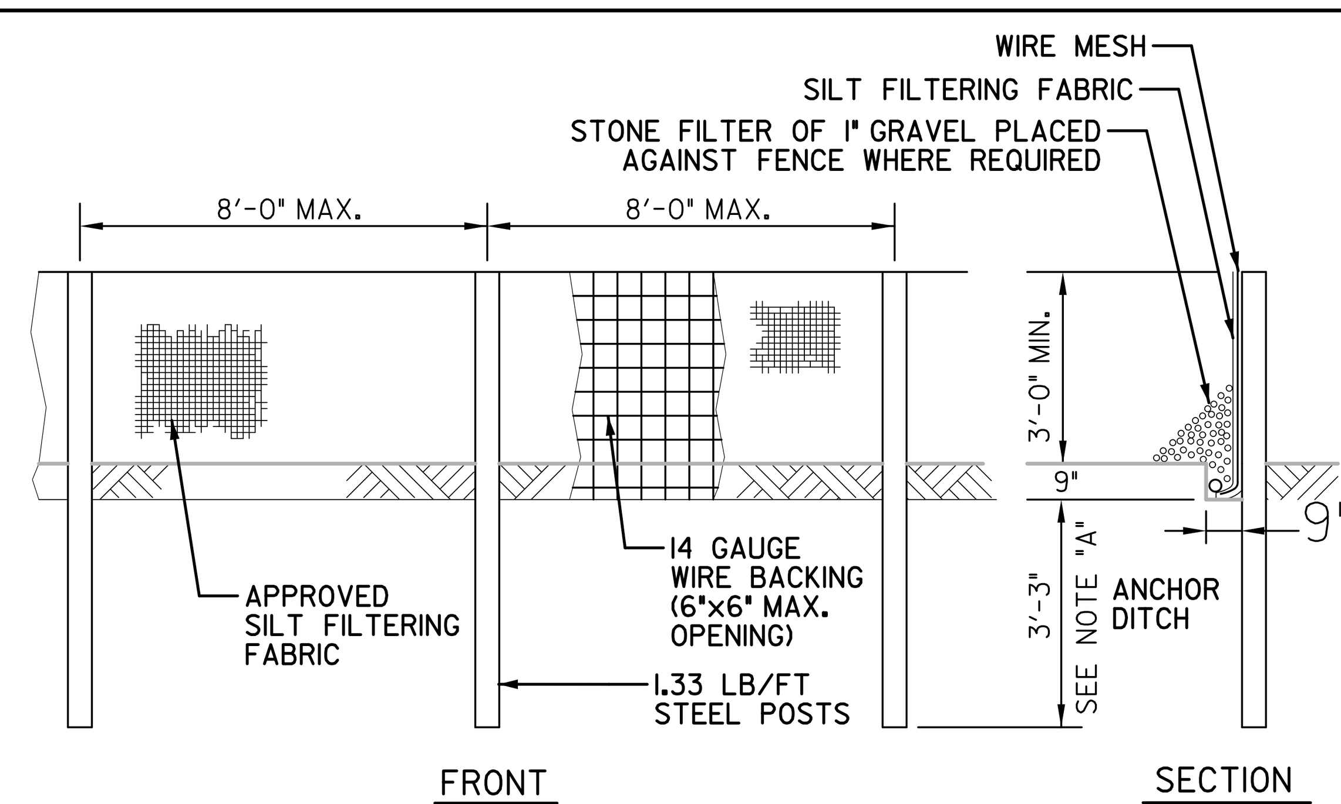
PROVIDE STAPLES MADE OF 0.125 IN. DIAMETER STEEL WIRE FORMED INTO A U SHAPE NOT LESS THAN 12" IN LENGTH.

INSTALL STAPLES APPROXIMATELY EVERY 1 LINEAR FOOT ON BOTH SIDES OF WATTLE AND AT EACH END TO SECURE IT TO THE SOIL.

WATTLE INSTALLATION CAN BE ON OUTSIDE OF THE SILT FENCE AS DIRECTED.

INSTALL TEMPORARY SILT FENCE IN ACCORDANCE WITH SECTION 1605 OF THE STANDARD SPECIFICATIONS.

2 / 3A COIR LOG WATTLE SILT FENCE OUTLET
NOT TO SCALE



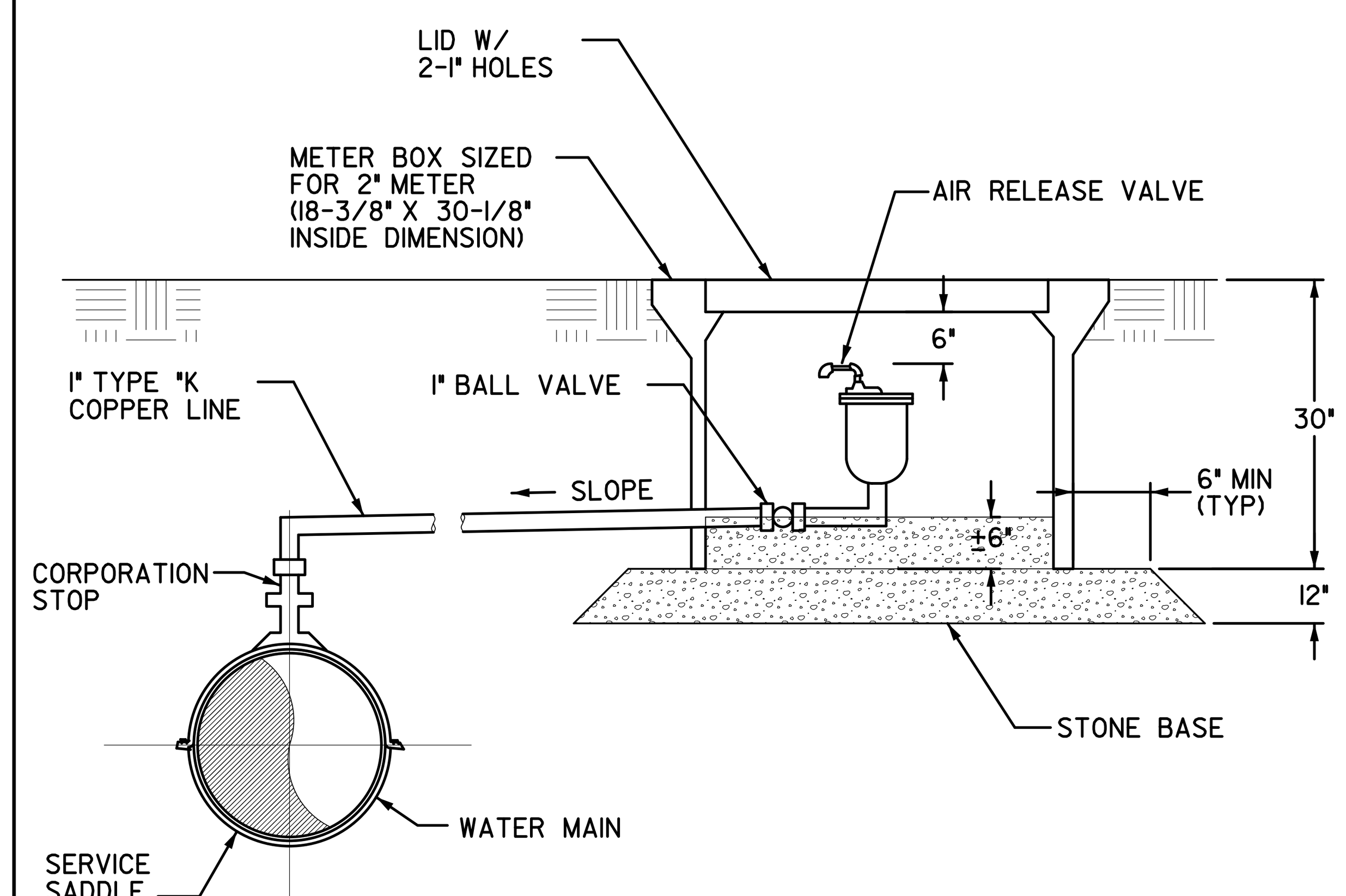
NOTES:

A) POSTS SET AT DEPTHS OF 4' FOR EARTH BACKFILL. ANCHOR DITCH IS 9"x9" AND FILL IS TO BE COMPACTED.

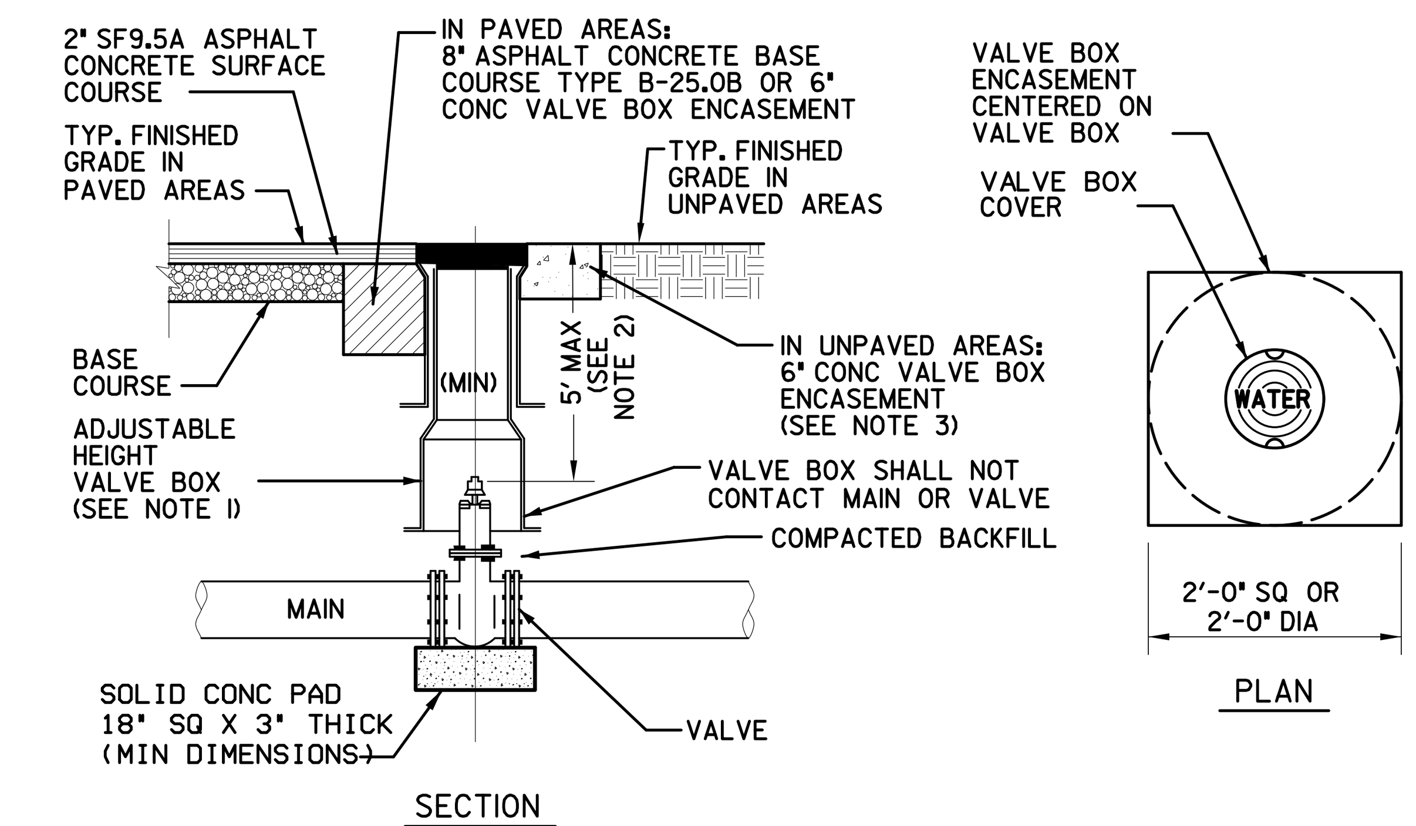
B) PROVIDE ADEQUATE EXCAVATION AHEAD OF SILT FENCE TO ACT AS A VELOCITY BREAK AND SILT TRAP.

C) CONTRACTOR MAY USE ALTERNATE MATERIAL OR METHOD UPON APPROVAL FROM ENGINEER.

5 / 3A SILT FENCE
NOT TO SCALE



6 / 3A AIR RELEASE ASSEMBLY
NOT TO SCALE



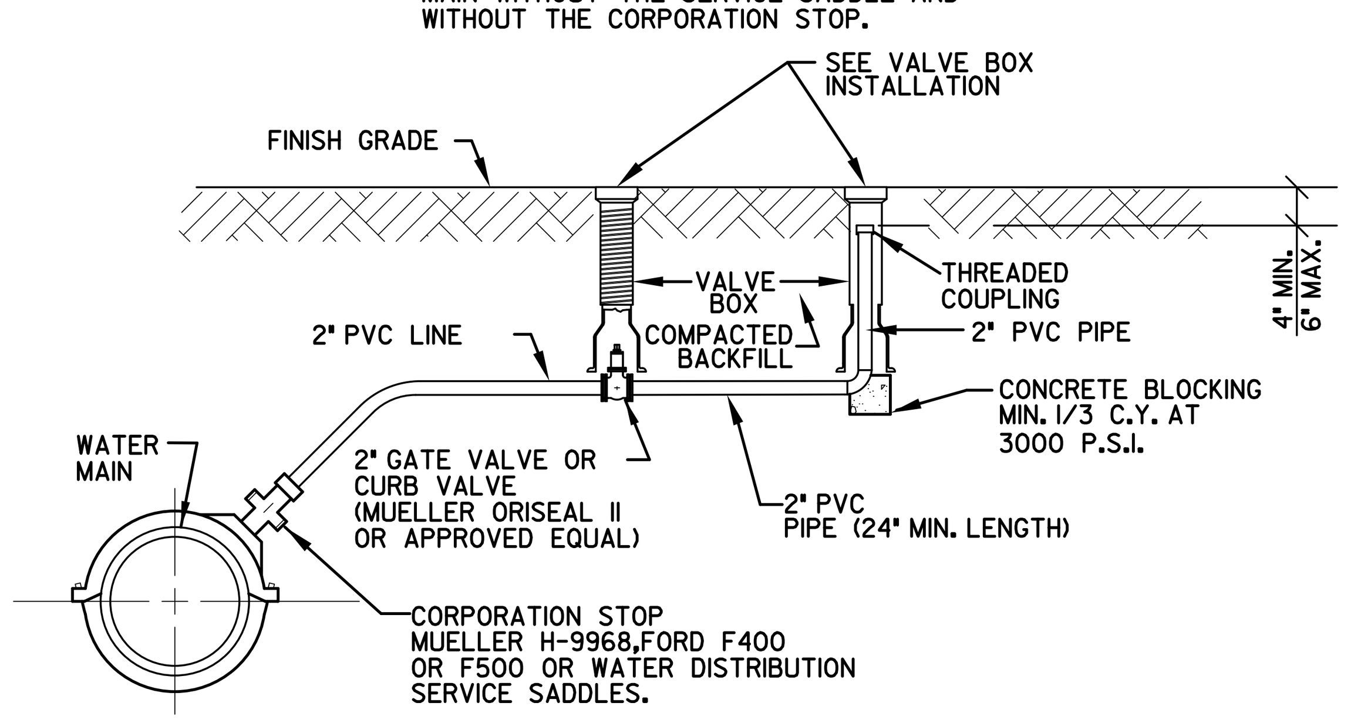
NOTES:

1. DIP MAY BE USED FOR VALVE BOX EXTENSIONS.
2. WHERE DEPTH OF VALVE OPERATING NUT IS GREATER THAN 5', CONTRACTOR SHALL PROVIDE AND INSTALL EXTENSION STEM USING A MANUFACTURER APPROVED EXTENSION KIT. DEPTH OF EXTENDED OPERATING NUT SHALL BE NO GREATER THAN 2'.
3. PRECAST CONCRETE ENCASEMENT IS ALLOWED OUTSIDE OF PAVED AREAS.

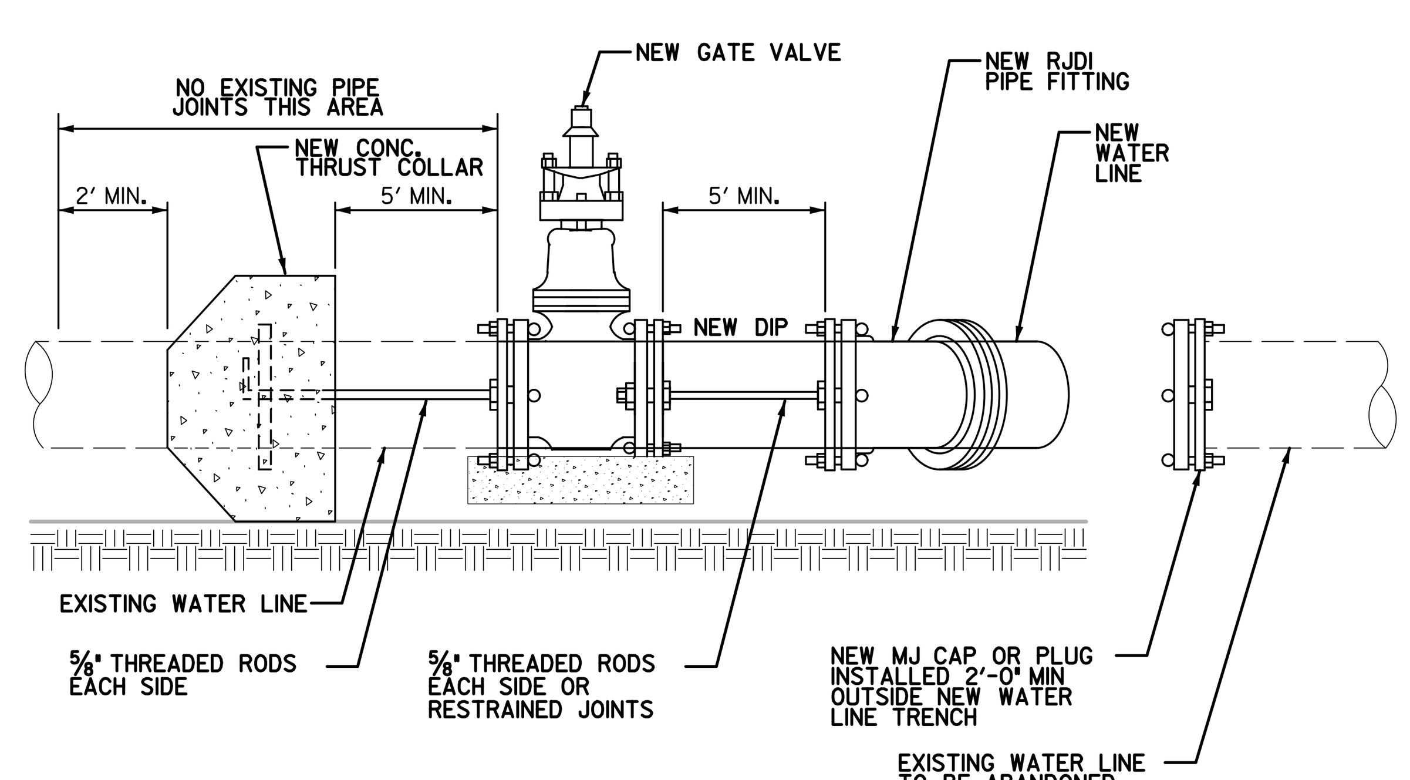
7 / 3A VALVE BOX INSTALLATION
NOT TO SCALE

NOTE: FOR DEADEND INSTALLATIONS USE A MECHANICAL JOINT TAPPED CAP, TAPPED FOR 2" NIPPLE, IN LIEU OF TAPPING MAIN. CAP SHALL BE PROPERLY INSTALLED WITH THRUST COLLAR.

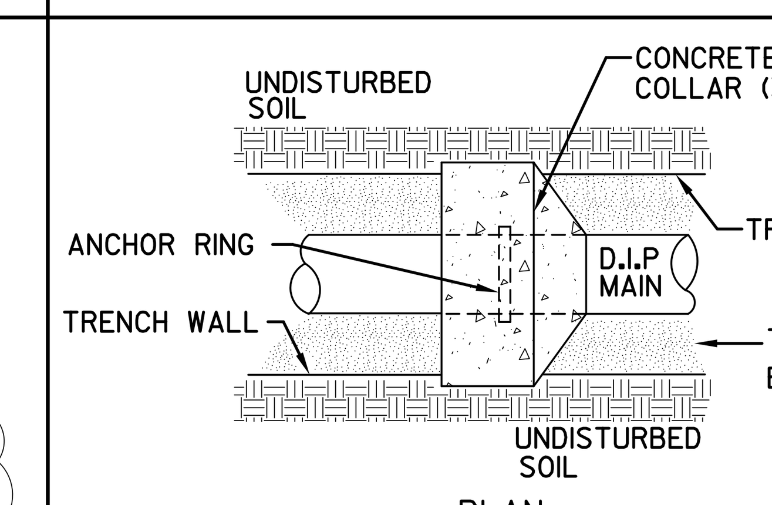
BLOW-OFF ASSEMBLY FOR 2" MAINS ARE TO BE CONSTRUCTED AS A CONTINUATION OF THE MAIN WITHOUT THE SERVICE SADDLE AND WITHOUT THE CORPORATION STOP.

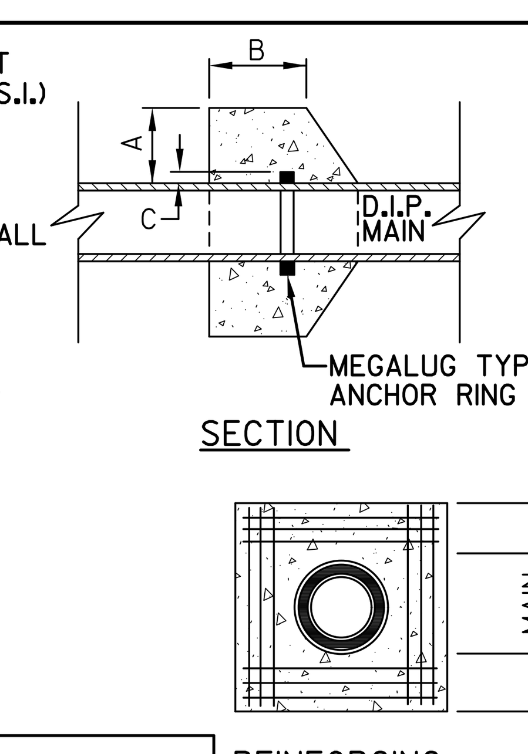


8 / 3A STANDARD 2" BLOW-OFF ASSEMBLY
NOT TO SCALE



10 / 3A NEW VALVE AND PIPE BEND WITH THRUST COLLAR CUT INTO EXISTING WATER LINE
NOT TO SCALE

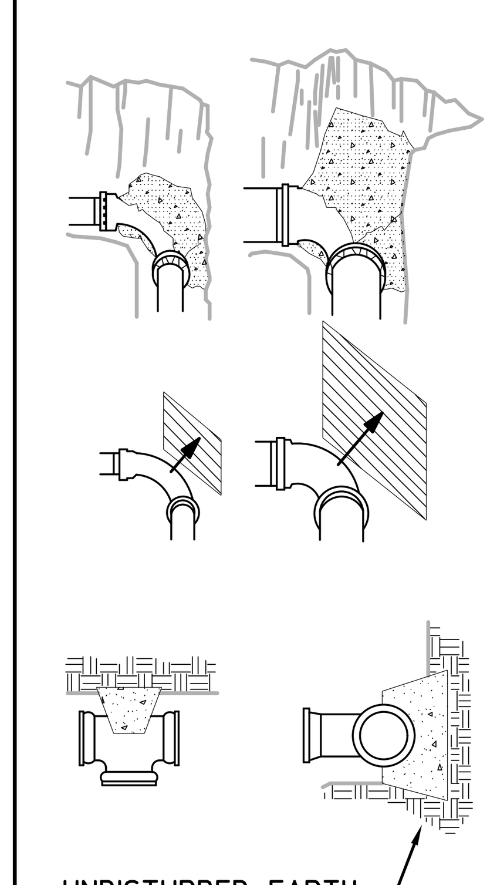




NOTES:
6" TO 16" MAINS=12-NO.7 BARS
20" TO 36" MAINS=12-NO.8 BARS
BARS PLACED AS SHOWN

SCHEDULE				
PIPE DIA.	CONCRETE THRUST COLLAR		ANCHOR RING	RING REQUIRED
	A	B	C	
6" - 12"	1'-0"	1'-0"	2"	ONE
16"	1'-4"	1'-0"	2"	ONE
20"	1'-4"	1'-0"	3"	ONE
24"	1'-4"	1'-0"	3"	TWO
30"	1'-4"	1'-2"	4"	TWO
36"	1'-4"	1'-4"	4"	TWO

11 / 3A THRUST COLLAR INSTALLATION
NOT TO SCALE



MINIMUM CONCRETE BLOCKING (C.Y.)*					
NOM. PIPE (I.D.)	TEES & DEAD ENDS	90° BEND	45° BEND	22 1/2° BEND	11 1/4° BEND
4	.34	.34	.34	.34	.34
6	.34	.34	.34	.34	.34
8	.34	.50	.34	.34	.34
10	.67	.75	.50	.34	.34
12	.75	1.0	.67	.34	.34
14	1.0	1.5	.75	.50	.34
16	1.34	2.0	1.0	.50	.34
18	1.67	2.34	1.34	.67	.34
20	2.0	3.0	1.67	.75	.50
24	3.0	4.34	2.34	1.34	.67

*CONCRETE SHALL BE 3000 P.S.I. MIX.
NOTE: NO CONCRETE SHALL COVER BOLTS OR GLANDS.

12 / 3A STANDARD REACTION BLOCKING
NOT TO SCALE

$$$$DATE$$$$ $$$$$$SYSTIME$$$$ $$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$ $$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
17BP.7.R.103 – ROCKINGHAM 248	UC-4

DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:
REVISED:

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
UTILITIES ENGINEERING SEC.
PHONE: (919) 707-6690
FAX: (919) 250-4151

NORTH CAROLINA PROFESSIONAL 4/20/2017 SEAL 37878 ENGINEER JAMES R. GREGG
DocuSigned by: James Gregg

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UTILITY CONSTRUCTION PLANS ONLY

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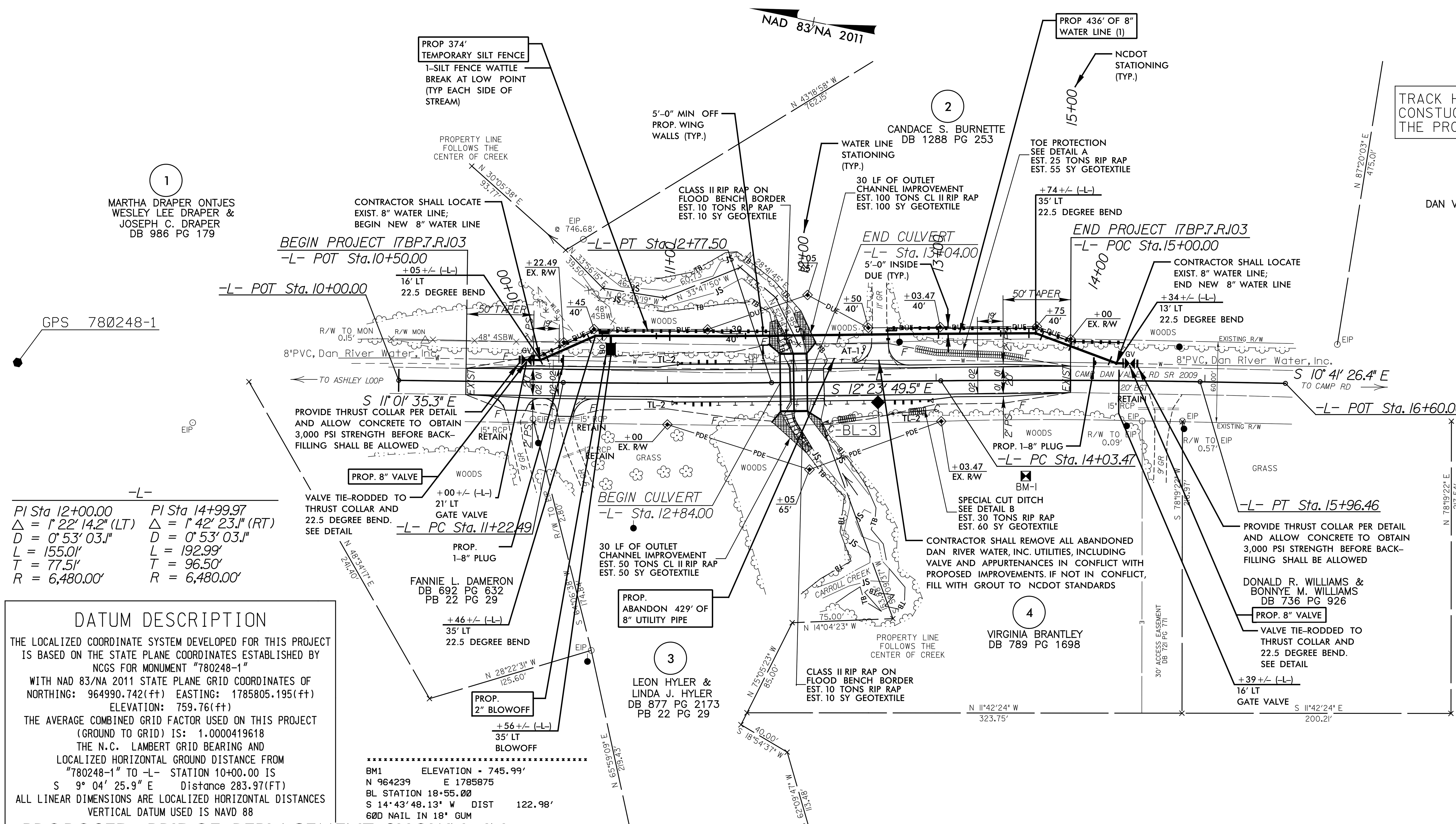
919.828.0531 fax 919.834.3589
License Number: F-0115

VERTICAL SCALE 5' 0 5' 10'
HORIZONTAL SCALE 25' 0 25' 50'

UTILITY CONSTRUCTION

TRACK HOE EXCAVATOR SHALL BE USED FOR CONSTUCTION IN LIEU OF A CRANE DUE TO THE PROXIMITY OF OVERHEAD POWER LINES



-L-

PI Sta 12+00.00	PI Sta 14+99.97
△ = 1° 22' 14.2" (LT)	△ = 1° 42' 23.1" (RT)
D = 0° 53' 03.1"	D = 0° 53' 03.1"
L = 155.01'	L = 192.99'
T = 77.51'	T = 96.50'
R = 6,480.00'	R = 6,480.00'

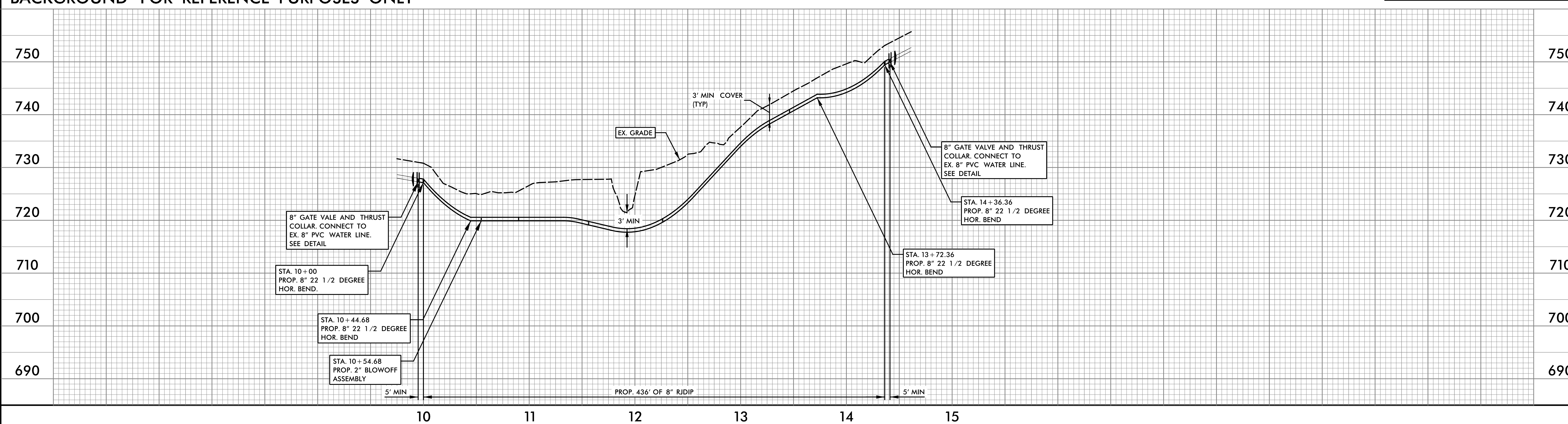
DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCGS FOR MONUMENT "780248-1"
WITH NAD 83/NA 2011 STATE PLANE GRID COORDINATES OF
NORTHING: 964990.742(ft) EASTING: 1785805.195(ft)
ELEVATION: 759.76(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 1.0000419618
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "780248-1" TO -L- STATION 10+00.00 IS
S 9° 04' 25.9" E Distance 283.97(FT)
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

BM1 ELEVATION = 745.99'
N 964239 E 1785875
BL STATION 18+55.00
S 14°43'48.13" W DIST 122.98'
60D NAIL IN 18" GUM

PROPOSED BRIDGE REPLACEMENT SHOWN IN BACKGROUND FOR REFERENCE PURPOSES ONLY

THE ESTIMATED QUANTITY OF DUCTILE IRON WATER PIPE FITTINGS ON THIS PLAN SHEET IS 440 POUNDS. THE ACTUAL QUANTITY AND TYPE OF FITTINGS WILL VARY BASED ON FIELD CONDITIONS.



REVISIONS

8/17/99

4/20/2017
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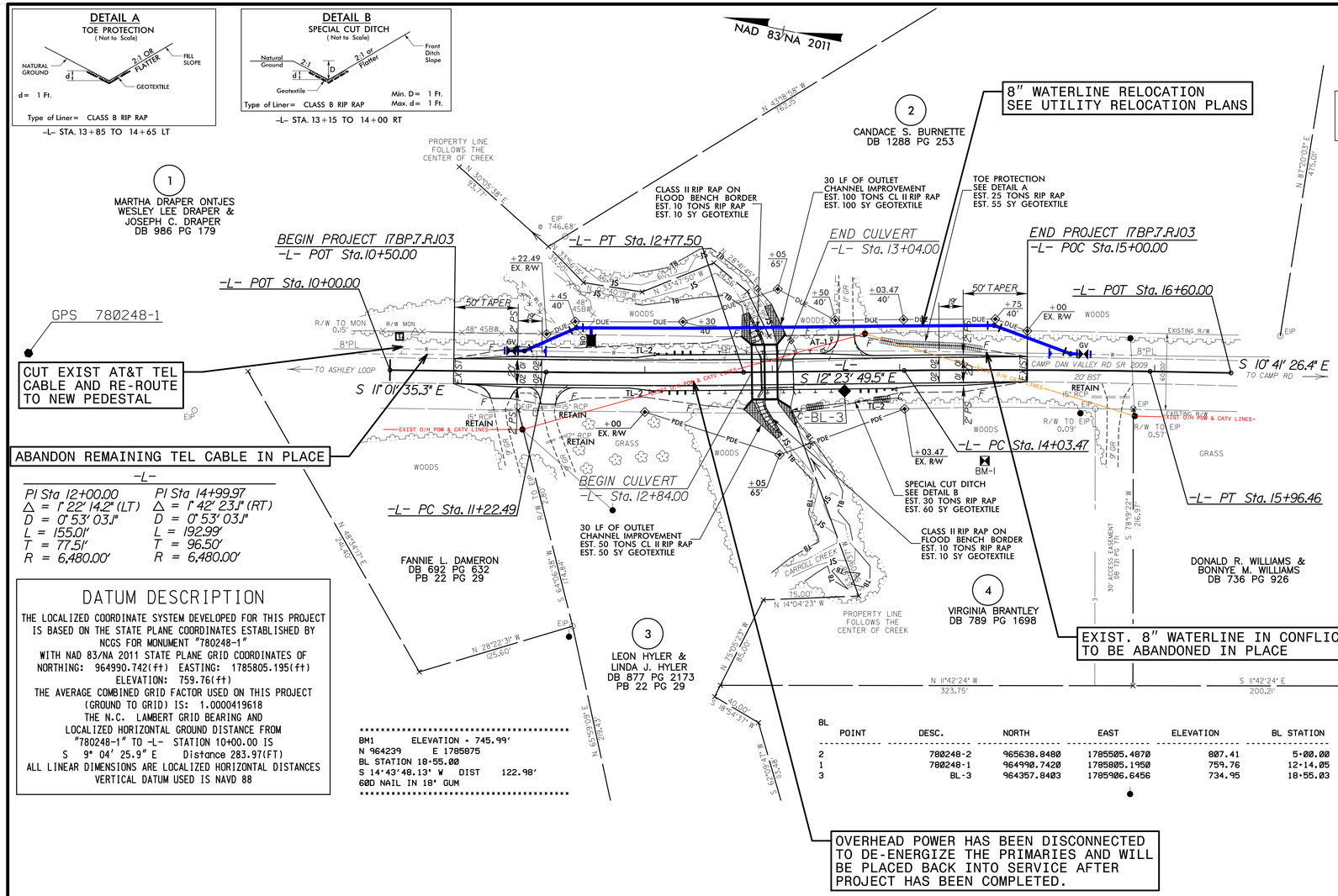
jharris



PROJECT REFERENCE	SHEET NO.
17BP.7.R.103 – ROCKINGHAM 248	UO–1

Prepared in the Office of:

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120 North Boylan Avenue Raleigh NC 27603-1423
919.828.0531 fax 919.834.3589
License Number: F-0115

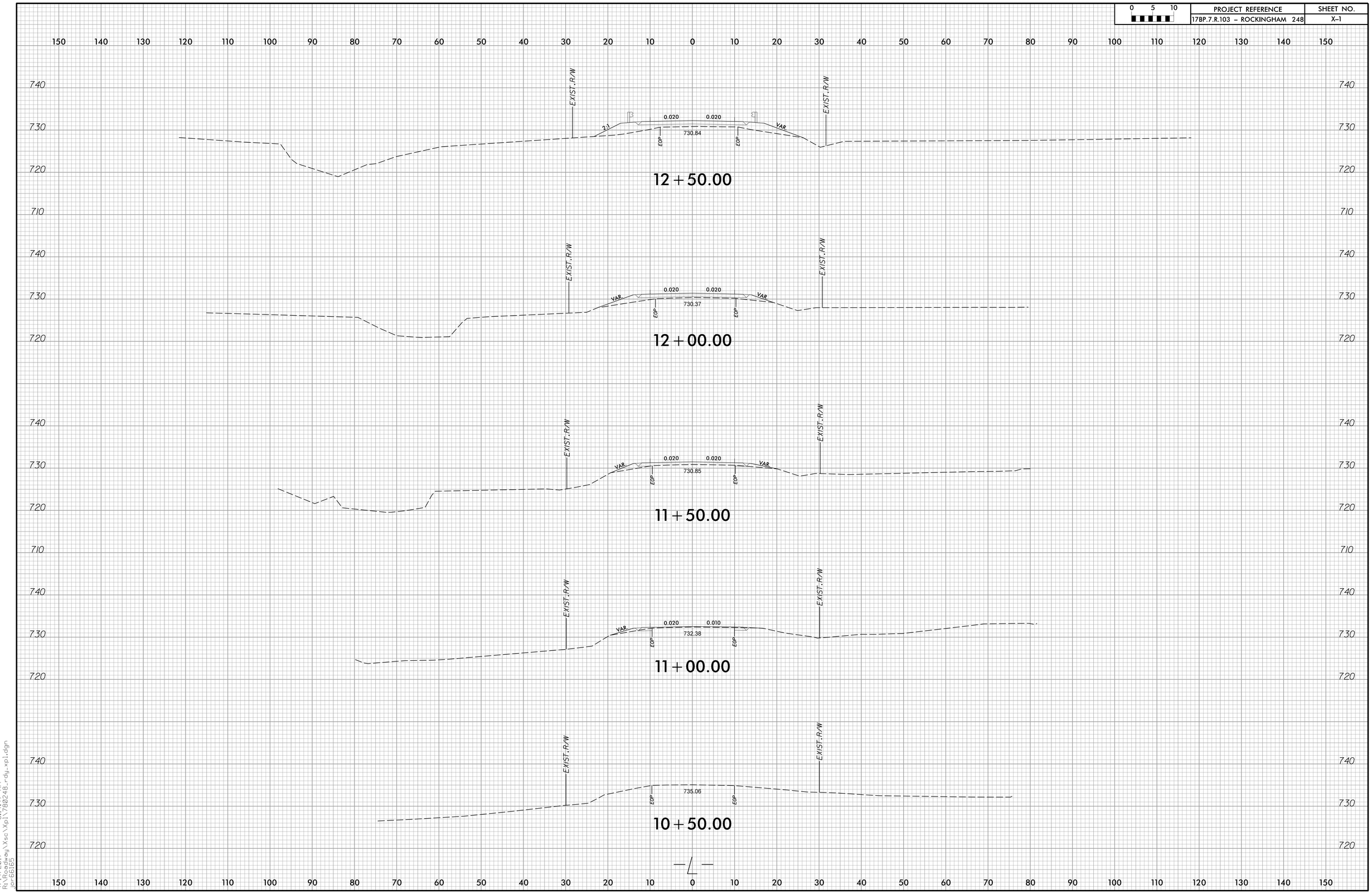
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALE
25' 0 25' 50'

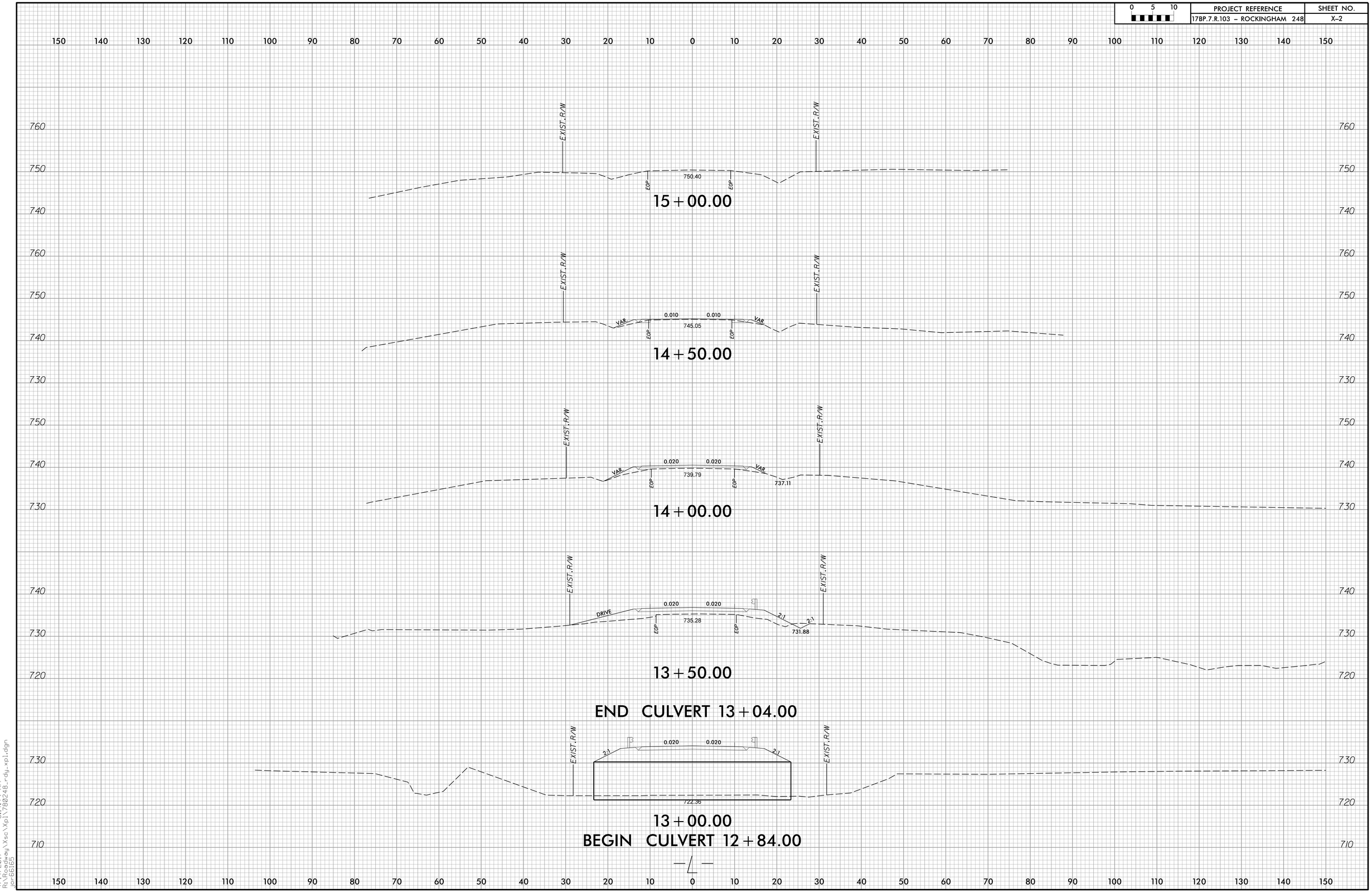
UTILITIES BY OTHERS

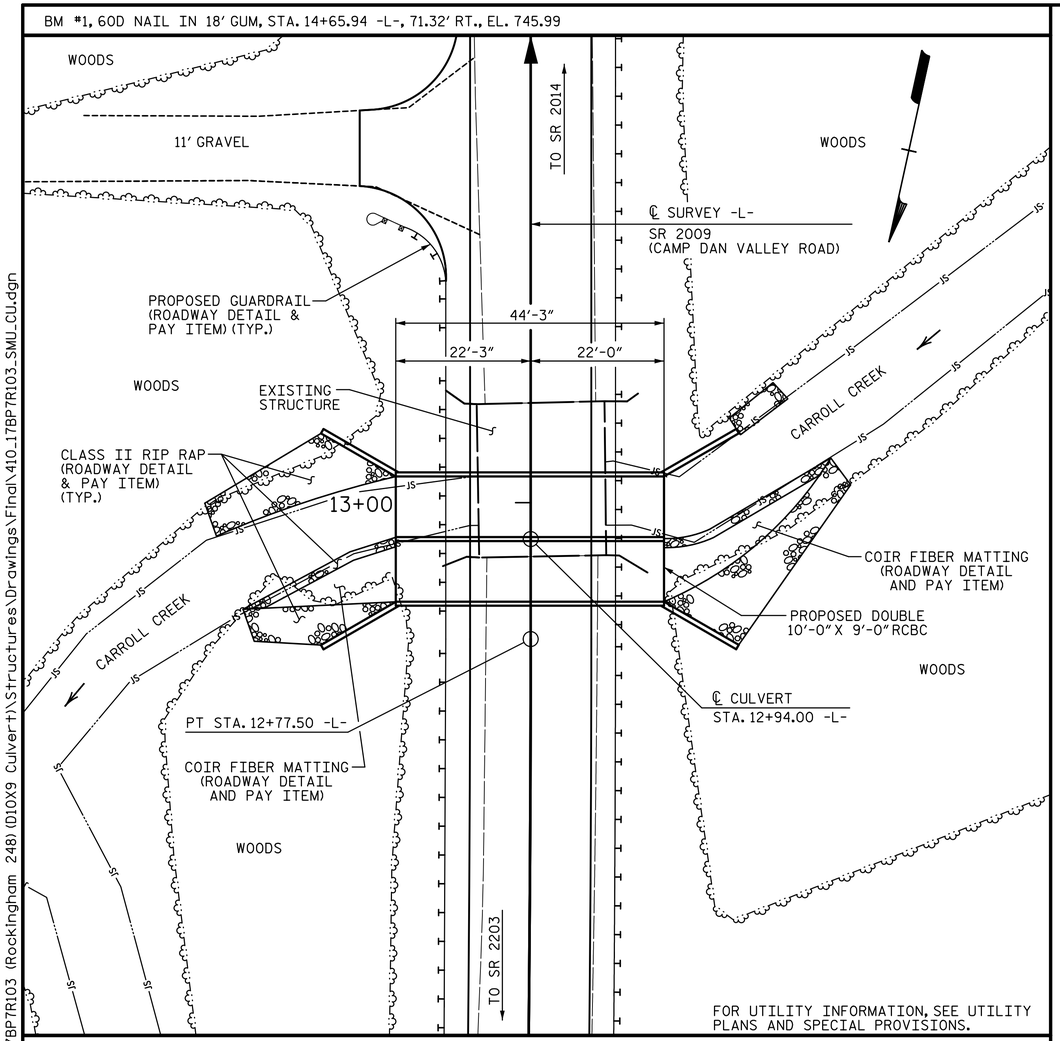
NOTE:
ALL PROPOSED UTILITY WORK SHOWN ON THIS SHEET WILL BE DONE BY OTHERS

0 5 10	PROJECT REFERENCE	SHEET NO.
	17BP.7.R.103 – ROCKINGHAM 248	X–1

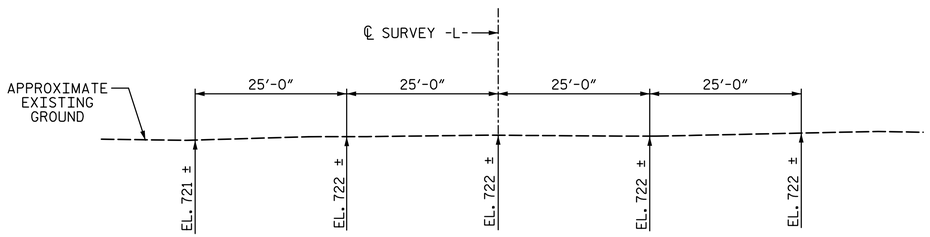


0 5 10	PROJECT REFERENCE	SHEET NO.
	17BP.7.R.103 – ROCKINGHAM 248	X–2





LOCATION SKETCH



PROFILE ALONG ℄ CULVERT

DRAWN BY: D.G. VESTER DATE: 7-16
CHECKED BY: B.S. COX DATE: 7-16
DESIGN ENGINEER OF RECORD: B.S. COX DATE: 7-16

4/14/2017 8:26:28 AM G:\Projects\2015\Division 7 (Hatch Mott)\17BP7R103 (Rockingham 248) (D10X9 Culvert)\Structures\Drawings\Final\410_17BP7R103_SMU_CU.dgn

HYDRAULIC DATA:

DESIGN DISCHARGE	= 1000 CFS
FREQUENCY OF DESIGN FLOOD	= 25 YEAR
DESIGN HIGH WATER ELEVATION	= 729.2
DRAINAGE AREA	= 1.5 SQ. MI.
BASE DISCHARGE (Q 100)	= 1200 CFS
BASE HIGH WATER ELEVATION	= 730.06

OVERTOPPING FLOOD DATA:

OVERTOPPING DISCHARGE	= 1460 CFS
FREQUENCY OF OVERTOPPING FLOOD	= 500± YEAR
OVERTOPPING FLOOD ELEVATION	= 731.3 ✱✱

✱✱ OVERTOPPING OCCURS AT ROADWAY SAG AT STA. 11+79 -L- AT ROADWAY CENTERLINE

HORIZONTAL CURVE DATA

PI STA. 12+00.00 -L-	PI STA. 14+99.97 -L-
Δ = 01°-22'-14.2"(LT.)	Δ = 01°-42'-23.1"(RT.)
D = 0°-53'-03.1"	D = 0°-53'-03.1"
L = 155.01'	L = 192.99'
T = 77.51'	T = 96.50'
R = 6480.00'	R = 6480.00'

GRADE DATA:

GRADE POINT EL. @ STA. 12+94.00 -L- = EL. 733.80
BED EL. @ STA. 12+94.00 -L- = EL. 720.84
ROADWAY SLOPE 2:1

TOTAL STRUCTURE QUANTITIES

CLASS A CONCRETE			
BARREL @	2.440	CY/FT	108.0 C.Y.
HEADWALLS			2.0 C.Y.
SILLS			2.2 C.Y.
WING ETC.			28.5 C.Y.
TOTAL			140.7 C.Y.
REINFORCING STEEL			
BARREL			13,911 LBS.
WINGS ETC.			1803 LBS.
TOTAL			15,714 LBS.
CULVERT EXCAVATION			LUMP SUM
FOUNDATION CONDITIONING MATERIAL			81 TONS
REMOVAL OF EXISTING STRUCTURE			LUMP SUM
ASBESTOS ASSESSMENT			LUMP SUM

FOUNDATION NOTES:

EXCAVATE A MINIMUM OF 1.0 FOOT BELOW BEARING ELEVATION AND REPLACE WITH FOUNDATION CONDITIONING MATERIAL PER SECTION 414 OF THE STANDARD SPECIFICATIONS.

OVEREXCAVATE LOOSE/SOFT MATERIAL IF PRESENT TO SUITABLE BEARING MATERIALS AND REPLACE WITH ADDITIONAL CLASS VI FOUNDATION CONDITIONING MATERIAL. PAYMENT IS INCLUDED IN THE LUMP SUM PRICE FOR CULVERT EXCAVATION.

WHERE EXCAVATION EXTENDS INTO CRYSTALLINE ROCK, A MINIMUM OF 6 INCHES OF FOUNDATION CONDITIONING MATERIAL IS REQUIRED.

NOTES:

ASSUMED LIVE LOAD ----------HL-93 OR ALTERNATE LOADING.

DESIGN FILL---------- 2'-6"(MIN.) AND 4'-6"(MAX.)

FOR OTHER DESIGN DATA AND NOTES SEE STANDARD NOTE SHEET.

3"Ø WEEP HOLES INDICATED TO BE IN ACCORDANCE WITH THE SPECIFICATIONS.

CONCRETE IN CULVERTS TO BE POURED IN THE FOLLOWING ORDER:
1. WING FOOTINGS AND FLOOR SLAB INCLUDING 4" OF ALL VERTICAL WALLS.
2. THE REMAINING PORTIONS OF THE WALLS AND WINGS FULL HEIGHT FOLLOWED BY ROOF SLAB AND HEADWALLS.

THE ENGINEER SHALL CHECK THE LENGTH OF CULVERT BEFORE STAKING IT OUT TO MAKE CERTAIN THAT IT WILL PROPERLY TAKE CARE OF THE FILL.

DIMENSIONS FOR WING LAYOUT AS WELL AS ADDITIONAL REINFORCING STEEL EMBEDDED IN BARREL ARE SHOWN ON WING SHEET.

STEEL IN THE BOTTOM SLAB MAY BE SPLICED AT THE PERMITTED CONSTRUCTION JOINT AT THE CONTRACTOR'S OPTION. EXTRA WEIGHT OF STEEL DUE TO THE SPLICES SHALL BE PAID FOR BY THE CONTRACTOR.

AT THE CONTRACTOR'S OPTION, HE MAY SPLICE THE VERTICAL REINFORCING STEEL IN THE INTERIOR FACE OF EXTERIOR WALL AND BOTH FACES OF INTERIOR WALLS ABOVE LOWER WALL CONSTRUCTION JOINT. THE SPLICE LENGTH SHALL BE AS PROVIDED IN THE SPLICE LENGTH CHART SHOWN ON THE PLANS. EXTRA WEIGHT OF STEEL DUE TO THE SPLICES SHALL BE PAID FOR BY THE CONTRACTOR.

REMOVAL OF THE EXISTING BRIDGE SHALL BE PERFORMED SO AS NOT TO ALLOW DEBRIS TO FALL INTO THE WATER. THE CONTRACTOR SHALL REMOVE THE BRIDGE AND SUBMIT PLANS FOR DEMOLITION IN ACCORDANCE WITH ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS.

THE EXISTING STRUCTURE CONSISTS OF 1 SPAN @ 25'-6", THE SUPERSTRUCTURE CONSISTS OF A TIMBER DECK WITH ASPHALT WEARING SURFACE ON STEEL I-BEAMS. THE END BENTS ARE TIMBER CAPS, PILES, AND BULKHEADS. THE EXISTING STRUCTURE, WHICH IS LOCATED AT THE SITE OF THE PROPOSED STRUCTURE, SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY POSTED FOR LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE DETERIORATE DURING CONSTRUCTION OF THE PROPOSED BRIDGE, THE LOAD LIMIT MAY BE REDUCED AS NECESSARY DURING THE LIFE OF THE PROJECT.

FOR CULVERT DIVERSION DETAILS AND PAY ITEM, SEE EROSION CONTROL PLANS.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

A 3 FOOT STRIP OF FILTER FABRIC SHALL BE ATTACHED TO THE FILL FACE OF THE WING COVERING THE ENTIRE LENGTH OF THE EXPANSION JOINT.

FOR ASBESTOS ASSESSMENT FOR BRIDGE DEMOLITION AND RENOVATION ACTIVITIES, SEE SPECIAL PROVISIONS.

CULVERT MUST BE CAST-IN-PLACE, PRECAST OPTION WILL NOT BE ALLOWED.

INASMUCH AS THE PAINT SYSTEM ON THE EXISTING STRUCTURAL STEEL CONTAINS LEAD, THE CONTRACTOR'S ATTENTION IS DIRECTED TO ARTICLE 107-1 OF THE STANDARD SPECIFICATIONS. ANY COST RESULTING FROM COMPLIANCE WITH APPLICABLE STATE OR FEDERAL REGULATIONS PERTAINING TO HANDLING OF MATERIALS CONTAINING LEAD BASED PAINT SHALL BE INCLUDED IN THE BID PRICE FOR REMOVAL OF EXISTING STRUCTURE AT STATION 12+94.00 -L-.

PROJECT NO. 17BP.7.R.103
ROCKINGHAM COUNTY
STATION: 12+94.00 -L-

SHEET 1 OF 6 REPLACES BRIDGE #248

PLANS PREPARED BY:
SIMPSON ENGINEERS & ASSOCIATES
5640 Dillard Drive
Suite 200
Cary, NC 27518
(919) 852-0468
(919) 852-0598 (Fax)
www.simpsonengr.com
LICENSURE NO. C-2521

NORTH CAROLINA PROFESSIONAL SEAL 031268 ENGINEER BETSY S. COX
4/17/2017

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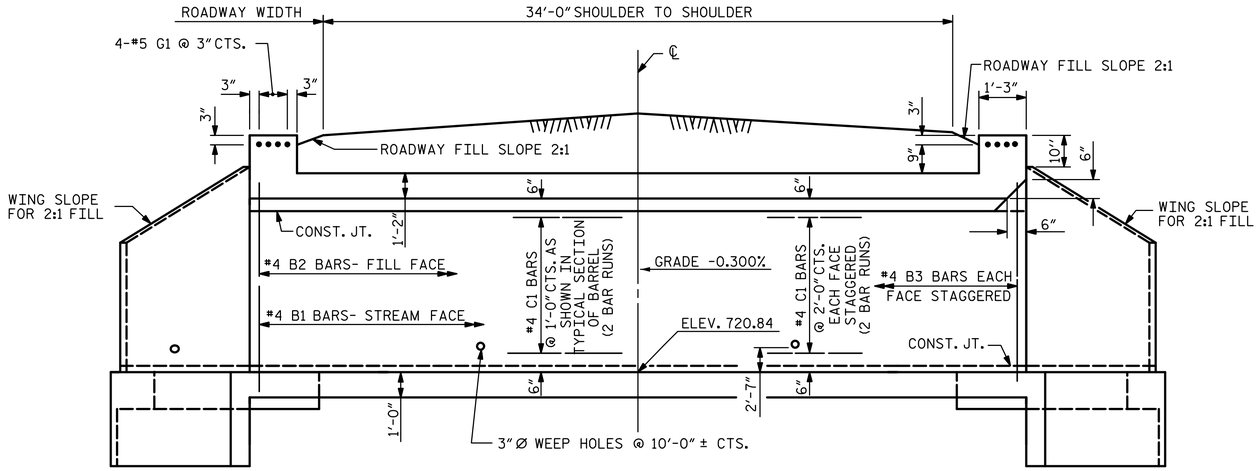
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DOUBLE 10 FT. X 9 FT. CONCETE BOX CULVERT

90° SKEW

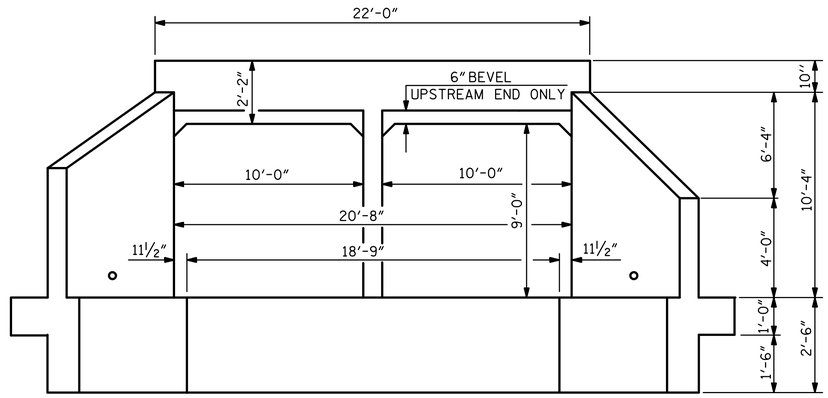
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-1
1			3			TOTAL SHEETS
2			4			6



EXTERIOR WALL INTERIOR WALL

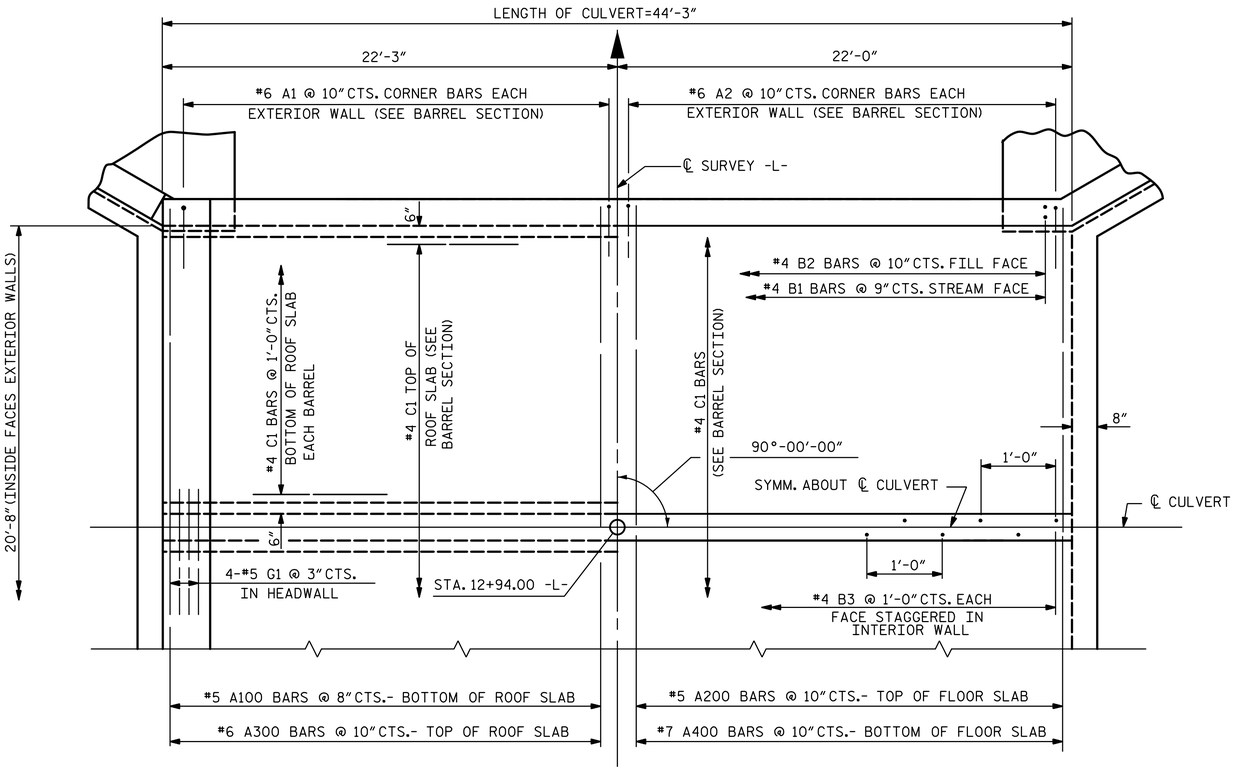
CULVERT SECTION NORMAL TO ROADWAY

(CONCRETE SILLS NOT SHOWN FOR CLARITY)



END ELEVATION - LOOKING DOWNSTREAM

(UPSTREAM END SHOWN, DOWNSTREAM END SIMILAR)



PART PLAN - ROOF SLAB

PART PLAN - FLOOR SLAB

(C1 BARS ARE 2 BAR RUNS) (CONCRETE SILLS NOT SHOWN FOR CLARITY)

DRAWN BY: D.G. VESTER DATE: 7-16
CHECKED BY: B.S. COX DATE: 7-16
DESIGN ENGINEER OF RECORD: B.S. COX DATE: 7-16

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Suite 200
Cary, NC 27518
(919) 852-0468
(919) 852-0598 (Fax)
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ROCKINGHAM COUNTY
STATION: 12+94.00 -L-

SHEET 2 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DOUBLE 10 FT. X 9 FT. CONCRETE BOX CULVERT

90° SKEW

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1			3			TOTAL SHEETS
2			4			6

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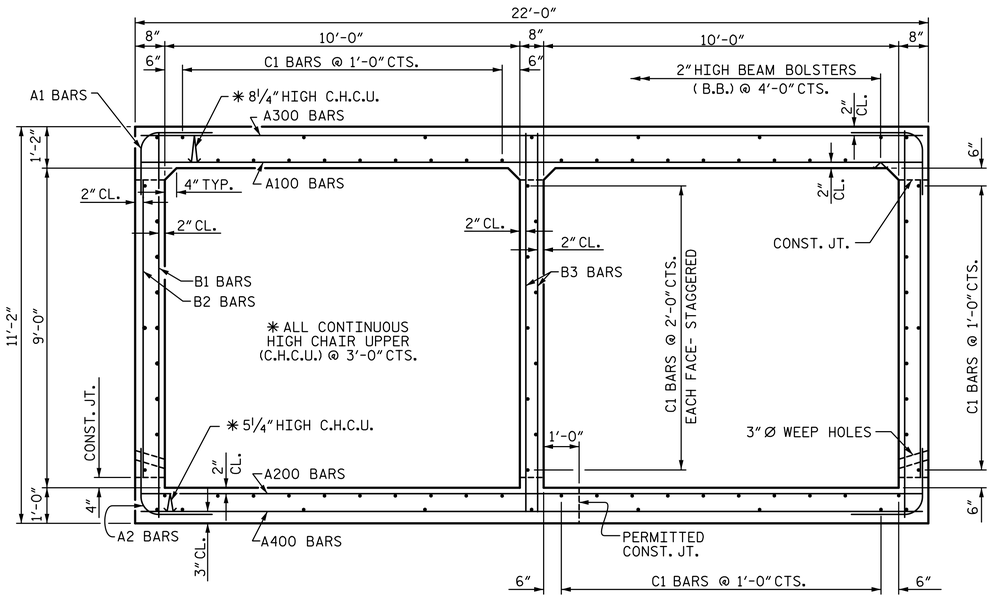
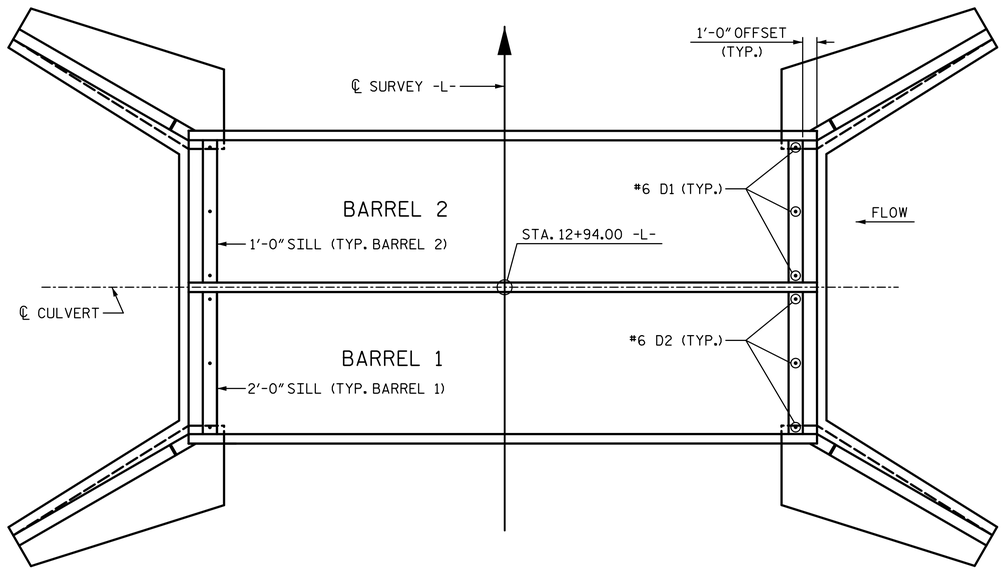


SECTION OF BARREL

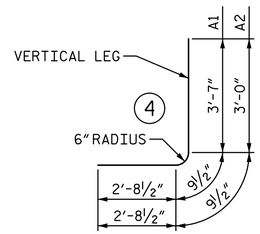
(THERE ARE 83 ''C'' BARS IN SECTION OF BARREL)



FLOOR PLAN

(SHOWING PLACEMENT OF SILLS)

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

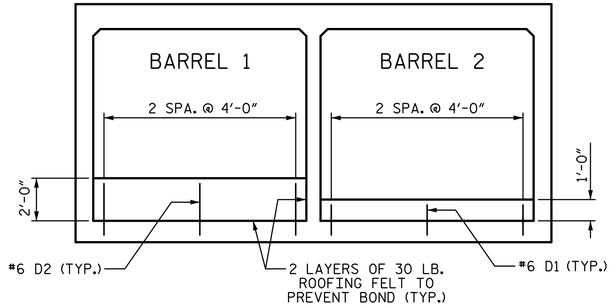
BILL OF MATERIAL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1	108	6	4	7′-1″	1149
A2	108	6	4	6′-6″	1054
A100	67	5	STR	21′-7″	1508
A200	54	5	STR	21′-7″	1216
A300	54	6	STR	21′-7″	1751
A400	54	7	STR	21′-7″	2382
B1	118	4	STR	10′-8″	841
B2	108	4	STR	8′-4″	601
B3	90	4	STR	10′-8″	641
C1	166	4	STR	23′-0″	2550
D1	6	6	STR	1′-6″	14
D2	6	6	STR	2′-6″	23
G1	8	5	STR	21′-8″	181
TOTAL REINFORCING STEEL					13911 LB

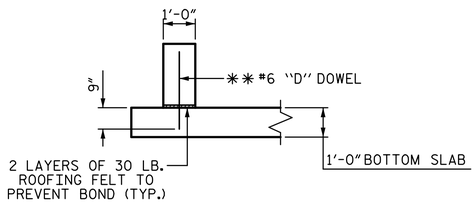
CLASS A CONCRETE BREAKDOWN	
BARREL	108.0 CY
HEADWALLS	2.0 CY
SILLS	2.2 CY

SPLICE CHART

- #4 B1 SPLICE LENGTH = 1′-9″
- #4 B3 SPLICE LENGTH = 1′-9″
- #4 C1 SPLICE LENGTH = 1′-11″
- #5 A200 SPLICE LENGTH = 2′-2″
- #7 A400 SPLICE LENGTH = 3′-9″



ELEVATION - LOOKING DOWNSTREAM



SECTION THROUGH SILL

✱✱ DOWELS MAY BE PUSHED INTO GREEN CONCRETE AFTER SLAB HAS BEEN FLOAT FINISHED.

CULVERT SILL DETAILS

BACKFILL BARREL 1 WITH 2′-0″ OF NATIVE MATERIALS
BACKFILL BARREL 2 WITH 1′-0″ OF NATIVE MATERIALS
(SEE CULVERT SURVEY AND HYDRAULIC DESIGN REPORT FOR DESCRIPTION OF AND PLACEMENT OF NATIVE MATERIALS.)

PROJECT NO. 17BP.7.R.103
ROCKINGHAM COUNTY
STATION: 12+94.00 -L-

SHEET 3 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DOUBLE 10 FT. X 9 FT. CONCRETE BOX CULVERT

90° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-3
1			3			TOTAL SHEETS
2			4			6

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5640 Dillard Drive
Suite 200
Cary, NC 27518
(919) 852-0468
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NORTH CAROLINA PROFESSIONAL SEAL 17268 ENGINEER BETSY S. COX
4/17/2017

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DESIGN ENGINEER OF RECORD: B.S. COX DATE: 7-16

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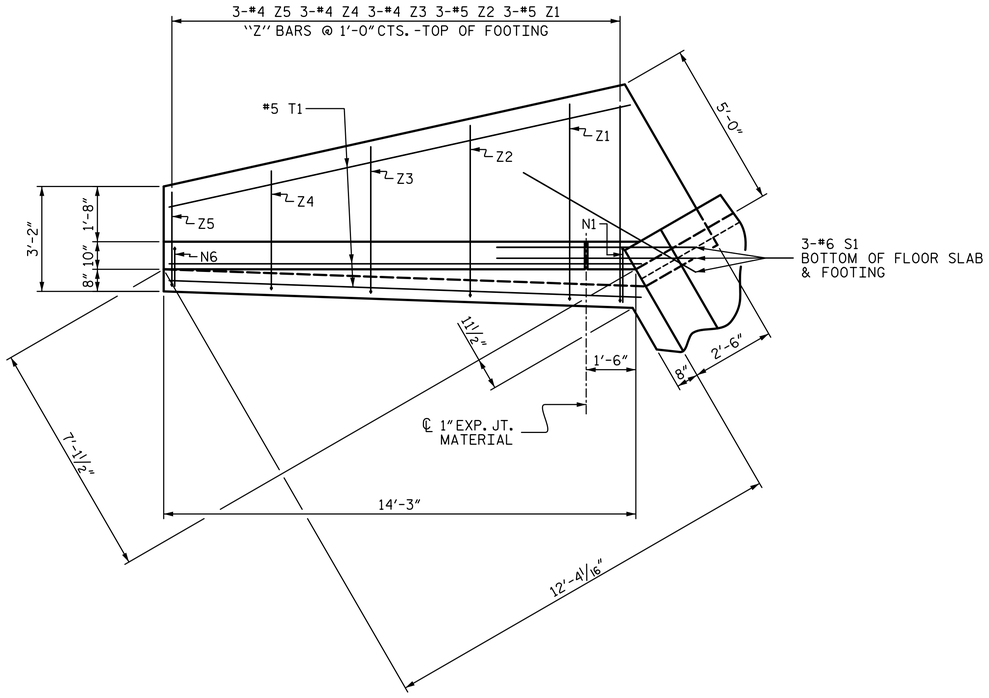
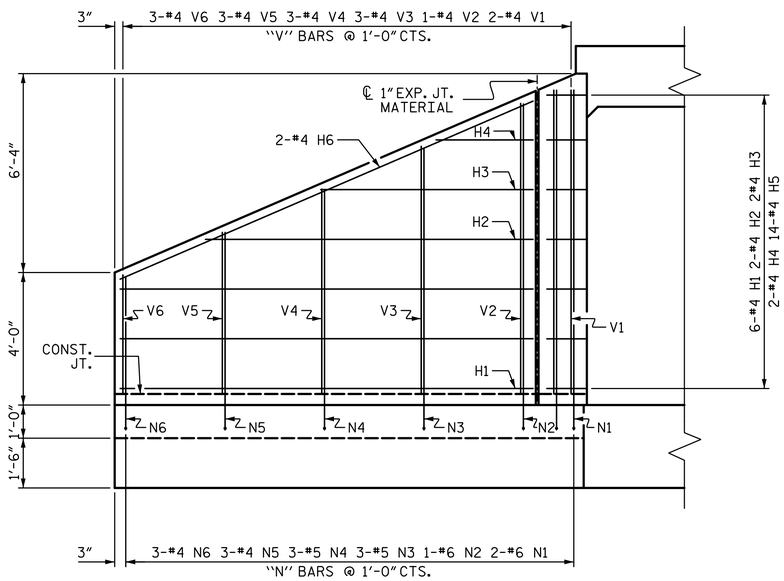
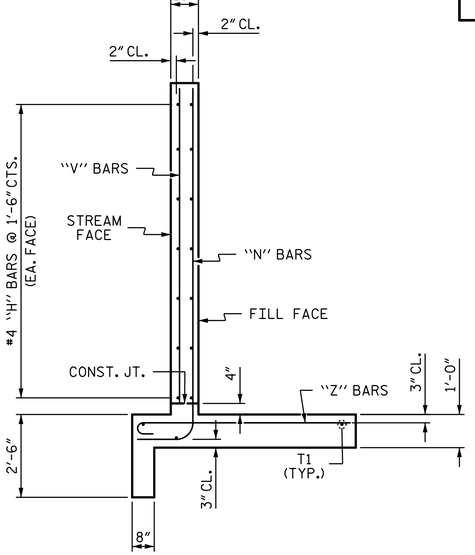


PLAN



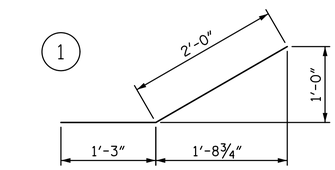
ELEVATION

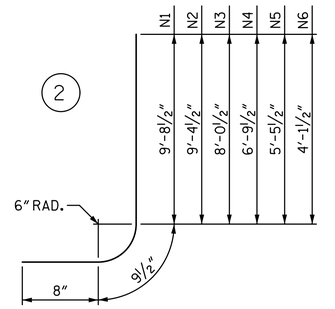


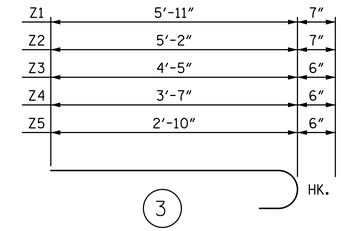
TYPICAL WING SECTION

BAR TYPES

ALL BAR DIMENSIONS ARE OUT TO OUT.







BILL OF MATERIAL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
H1	24	4	STR	12'-5"	199
H2	8	4	STR	9'-10"	53
H3	8	4	STR	6'-5"	34
H4	8	4	STR	2'-11"	16
H5	56	4	1	3'-3"	122
H6	8	4	STR	13'-6"	72
N1	8	6	2	11'-2"	134
N2	4	6	2	10'-10"	65
N3	12	5	2	9'-6"	119
N4	12	5	2	8'-3"	103
N5	12	4	2	6'-11"	55
N6	12	4	2	5'-7"	45
S1	12	6	STR	6'-0"	108
T1	12	5	STR	14'-3"	178
V1	8	4	STR	9'-2"	49
V2	4	4	STR	8'-9"	23
V3	12	4	STR	7'-5"	59
V4	12	4	STR	6'-2"	49
V5	12	4	STR	4'-10"	39
V6	12	4	STR	3'-7"	29
Z1	12	5	3	6'-6"	81
Z2	12	5	3	5'-9"	72
Z3	12	4	3	4'-11"	39
Z4	12	4	3	4'-1"	33
Z5	12	4	3	3'-4"	27

REINFORCING STEEL
FOR 4 WINGS 1803 LBS

CLASS A CONCRETE
4 WINGS 26.2 CY
2 END CURTAIN WALLS 2.3 CY
TOTAL 28.5 CY

PROJECT NO. 17BP.7.R.103
ROCKINGHAM COUNTY
STATION: 12+94.00 -L-

SHEET 4 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

WINGS FOR CONCRETE BOX CULVERT

H = 9'-0" SLOPE = 2:1
90° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-4
1			3			TOTAL SHEETS
2			4			6

DRAWN BY: D.G. VESTER DATE: 7-16
CHECKED BY: B.S. COX DATE: 7-16
DESIGN ENGINEER OF RECORD: B.S. COX DATE: 7-16

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SIMPSON ENGINEERS & ASSOCIATES
5640 Dillard Drive
Suite 200
Cary, NC 27518
(919) 852-0468
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4/17/2017

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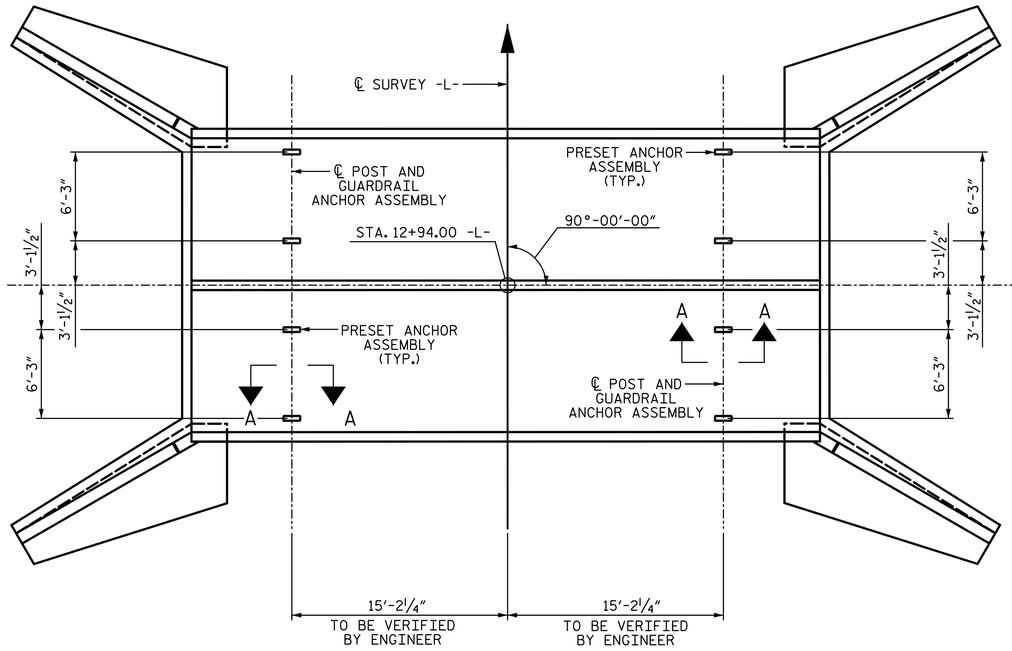
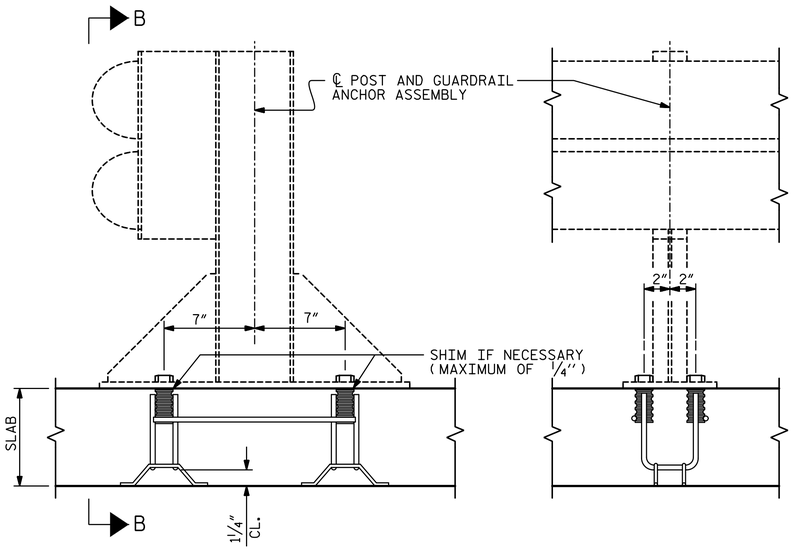
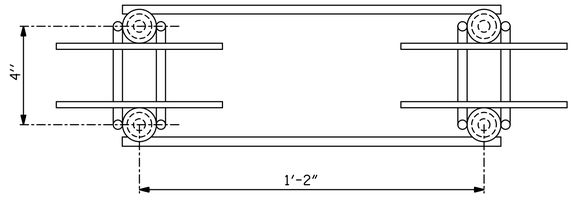


PLAN
(SHOWING GUARDRAIL ANCHOR ASSEMBLY SPACING)

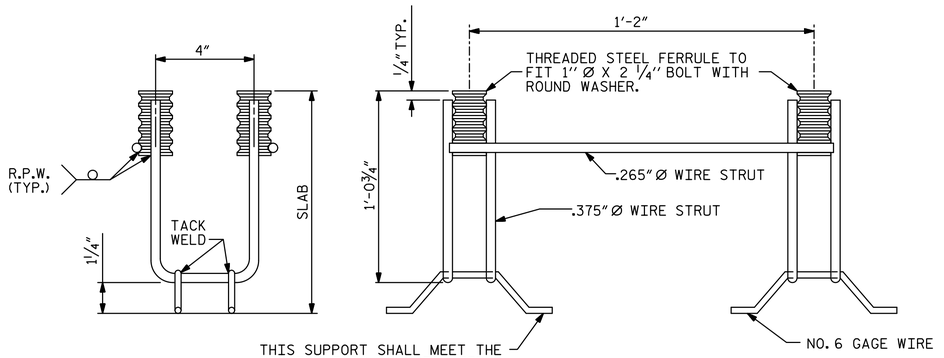


SECTION A-A

SECTION B-B



PLAN



ELEVATION

SIDE VIEW

GUARDRAIL ANCHOR ASSEMBLY FOR CULVERTS

NOTES:

THE GUARDRAIL ANCHOR ASSEMBLY FOR CULVERTS SHALL CONSIST OF THE FOLLOWING COMPONENTS :

A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 2½".

B. 4 - 1" Ø X 2 ¼" BOLTS WITH WASHERS, BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLTS AND WASHERS SHALL BE GALVANIZED. (AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 1" Ø X 2¼" GALVANIZED BOLTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.)

C. WIRE STRUTS SHOWN IN THE GUARDRAIL ANCHOR ASSEMBLY FOR CULVERTS DETAIL ARE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 P.S.I. AS AN OPTION, A 7/16" Ø WIRE STRUT WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI IS ACCEPTABLE.

GUARDRAIL ANCHOR ASSEMBLY WITH BOLTS SHALL BE ASSEMBLED IN THE SHOP. BOLT THREADS MAY BE RECUT AS NECESSARY TO INSURE FIT.

THE COST OF THE GUARDRAIL ANCHOR ASSEMBLY FOR CULVERTS COMPLETE IN PLACE, SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR CLASS "A" CONCRETE.

FERRULES TO BE PLUGGED DURING POURING OF SLAB AS RECOMMENDED BY THE MANUFACTURER.

AT THE CONTRACTOR'S OPTION, FERRULES WITH OPEN OR CLOSED ENDS MAY BE USED.

PAYMENT FOR GUARDRAIL, POSTS, AND POST BASE PLATES IS INCLUDED IN ROADWAY PAY ITEMS.

SLAB REINFORCING STEEL MAY BE SHIFTED AS NECESSARY TO CLEAR GUARDRAIL ANCHOR ASSEMBLY. CARE SHOULD BE TAKEN TO KEEP THE SHIFTING OF REINFORCING STEEL TO A MINIMUM.

THE CONTRACTOR MAY USE ADHESIVELY ANCHORED ANCHOR BOLTS IN PLACE OF GUARDRAIL ANCHOR ASSEMBLY. LEVEL TWO FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE 1"Ø BOLT IS 21.8 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE STANDARD SPECIFICATIONS.

DRAWN BY: D.G. VESTER DATE: 7-16
CHECKED BY: B.S. COX DATE: 7-16
DESIGN ENGINEER OF RECORD: B.S. COX DATE: 7-16

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Suite 200
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ROCKINGHAM COUNTY
STATION: 12+94.00 -L-

SHEET 5 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

ANCHORAGE DETAILS FOR GUARDRAIL ANCHOR ASSEMBLY FOR CULVERTS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-5
1			3			TOTAL SHEETS
2			4			6

LOAD AND RESISTANCE FACTOR RATING (LRFR) SUMMARY FOR REINFORCED CONCRETE BOX CULVERTS

LEVEL		VEHICLE	WEIGHT (W) (TONS)	⟨#⟩ CONTROLLING LOAD RATING	MINIMUM RATING FACTORS (RF)	TONS = W × RF	STRENGTH I LIMIT STATE									COMMENT NUMBER
								MOMENT				SHEAR				
							LIVE-LOAD FACTORS (γ_{LL})	RATING FACTOR	BOX NO.	ELEMENT TYPE	DISTANCE FROM LEFT END OF ELEMENT (ft)	RATING FACTOR	BOX NO.	ELEMENT TYPE	DISTANCE FROM LEFT END OF ELEMENT (ft)	
DESIGN LOAD RATING		HL-93 (INVENTORY)	N/A	⟨1⟩	1.32	- -	1.75	1.32	1	TOP SLAB - MID	4.27	1.62	1	TOP SLAB - RT END	9.47	
		HL-93 (OPERATING)	N/A		1.71	- -	1.35	1.71	1	TOP SLAB - MID	4.27	2.10	1	TOP SLAB - RT END	9.47	
		HS-20 (INVENTORY)	36.000	⟨2⟩	1.48	53.3	1.75	1.48	1	TOP SLAB - MID	4.27	1.94	1	TOP SLAB - RT END	9.47	
		HS-20 (OPERATING)	36.000		1.92	69.1	1.35	1.92	1	TOP SLAB - MID	4.27	2.51	1	TOP SLAB - RT END	9.47	
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		2.08	28.1	1.40	2.08	1	TOP SLAB - MID	4.27	2.77	1	TOP SLAB - RT END	9.47	
		SNGARBS2	20.000		1.95	39.0	1.40	1.95	1	TOP SLAB - MID	4.27	2.57	1	TOP SLAB - RT END	9.47	
		SNAGRIS2	22.000		2.08	45.8	1.40	2.08	1	TOP SLAB - MID	4.27	2.73	1	TOP SLAB - RT END	9.47	
		SNCOTTS3	27.250	⟨3⟩	1.33	36.2	1.40	1.33	1	TOP SLAB - MID	4.27	1.54	1	TOP SLAB - RT END	9.47	
		SNAGGRS4	34.925		1.66	58.0	1.40	1.66	1	TOP SLAB - MID	4.27	1.75	1	BOT SLAB - RT END	9.61	
		SNS5A	35.550		1.58	56.2	1.40	1.58	1	TOP SLAB - MID	4.27	1.77	1	TOP SLAB - RT END	9.47	
		SNS6A	39.950		1.58	63.1	1.40	1.58	1	TOP SLAB - MID	4.27	1.72	1	TOP SLAB - RT END	9.47	
		SNS7B	42.000		1.66	69.7	1.40	1.66	1	TOP SLAB - MID	4.27	1.69	1	BOT SLAB - RT END	9.61	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		1.87	61.7	1.40	2.08	1	TOP SLAB - MID	4.27	1.87	1	BOT SLAB - RT END	9.61	
		TNT4A	33.075		1.59	52.6	1.40	1.59	1	TOP SLAB - MID	4.27	1.76	1	TOP SLAB - RT END	9.47	
		TNT6A	41.600		1.62	67.4	1.40	1.62	1	TOP SLAB - MID	4.27	1.73	1	TOP SLAB - RT END	9.47	
		TNT7A	42.000		1.60	67.2	1.40	1.60	1	TOP SLAB - MID	4.27	1.74	1	TOP SLAB - RT END	9.47	
		TNT7B	42.000		1.56	65.5	1.40	1.56	1	TOP SLAB - MID	4.27	1.75	1	TOP SLAB - RT END	9.47	
		TNAGRIT4	43.000		1.59	68.4	1.40	1.59	1	TOP SLAB - MID	4.27	1.70	1	TOP SLAB - RT END	9.47	
		TNAGT5A	45.000		1.70	76.5	1.40	1.70	1	TOP SLAB - MID	4.27	1.70	1	TOP SLAB - RT END	9.47	
		TNAGT5B	45.000		1.46	65.7	1.40	1.59	1	TOP SLAB - MID	4.27	1.46	1	BOT SLAB - RT END	9.61	

LOAD FACTORS:

DESIGN LOAD RATING FACTORS

LOAD TYPE	MAX FACTOR	MIN FACTOR
DC	1.25	0.90
DW	1.50	0.65
EV	1.30	0.90
EH	1.35	0.90
ES	1.35	0.90
LS	1.75	--
WA	1.00	--

NOTE:

RATING FACTORS ARE BASED ON THE STRENGTH I LIMIT STATE.

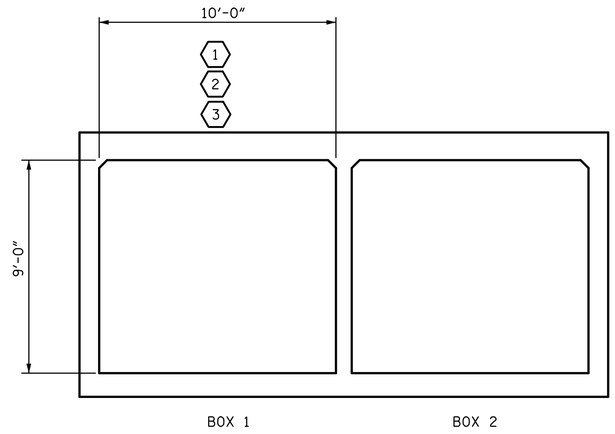
⟨#⟩ CONTROLLING LOAD RATING

⟨1⟩ DESIGN LOAD RATING (HL-93)

⟨2⟩ DESIGN LOAD RATING (HS-20)

⟨3⟩ LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE



LRFR SUMMARY

(LOOKING DOWNSTREAM)

PROJECT NO. 17BP.7.R.103

ROCKINGHAM COUNTY

STATION: 12+94.00 -L-

SHEET 6 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

LRFR SUMMARY FOR REINFORCED CONCRETE BOX CULVERTS

(NON-INTERSTATE TRAFFIC)

PLANS PREPARED BY:
SIMPSON ENGINEERS & ASSOCIATES
5640 Dillard Drive
Suite 200
Cary, NC 27518
(919) 852-0468
(919) 852-0598 (Fax)
www.simpsonengr.com
LICENSURE NO. C-2521

NORTH CAROLINA PROFESSIONAL SEAL 041268 ENGINEER BETSY S. COX
4/17/2017

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-6
1			3			TOTAL SHEETS
2			4			6

DRAWN BY: D.G. VESTER DATE: 7-16
CHECKED BY: B.S. COX DATE: 7-16
DESIGN ENGINEER OF RECORD: B.S. COX DATE: 7-16

4/14/2017 8:26:29 AM G:\Projects\2015\Division 7 (Hatch Mott)\17BP7R103 (Rockingham 248) (D10X9 Culvert)\Structures\Drawings\Final\410_17BP7R103_SMU_CU.dgn

STANDARD NOTES

DESIGN DATA:

SPECIFICATIONS	A.A.S.H.T.O. (CURRENT)
LIVE LOAD	SEE PLANS
IMPACT ALLOWANCE	SEE A.A.S.H.T.O.
STRESS IN EXTREME FIBER OF	
STRUCTURAL STEEL - AASHTO M270 GRADE 36	20,000 LBS. PER SQ. IN.
- AASHTO M270 GRADE 50W	27,000 LBS. PER SQ. IN.
- AASHTO M270 GRADE 50	27,000 LBS. PER SQ. IN.
REINFORCING STEEL IN TENSION	
GRADE 60	24,000 LBS. PER SQ. IN.
CONCRETE IN COMPRESSION	1,200 LBS. PER SQ. IN.
CONCRETE IN SHEAR	SEE A.A.S.H.T.O.
STRUCTURAL TIMBER - TREATED OR	
UNTREATED - EXTREME FIBER STRESS	1,800 LBS. PER SQ. IN.
COMPRESSION PERPENDICULAR TO GRAIN OF TIMBER	375 LBS. PER SQ. IN.
EQUIVALENT FLUID PRESSURE OF EARTH	30 LBS. PER CU. FT. (MINIMUM)

MATERIAL AND WORKMANSHIP:

EXCEPT AS MAY OTHERWISE BE SPECIFIED ON PLANS OR IN THE SPECIAL PROVISIONS, ALL MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE 2012 "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" OF THE N. C. DEPARTMENT OF TRANSPORTATION.

STEEL SHEET PILING FOR PERMANENT OR TEMPORARY APPLICATIONS SHALL BE HOT ROLLED.

CONCRETE:

UNLESS OTHERWISE REQUIRED ON PLANS, CLASS A CONCRETE SHALL BE USED FOR ALL PORTIONS OF ALL STRUCTURES WITH THE EXCEPTION THAT: CLASS AA CONCRETE SHALL BE USED IN BRIDGE SUPERSTRUCTURES, ABUTMENT BACKWALLS, AND APPROACH SLABS; AND CLASS B CONCRETE SHALL BE USED FOR SLOPE PROTECTION AND RIP RAP.

CONCRETE CHAMFERS:

UNLESS OTHERWISE NOTED ON THE PLANS, ALL EXPOSED CORNERS ON STRUCTURES SHALL BE CHAMFERED 3/4" WITH THE FOLLOWING EXCEPTIONS: TOP CORNERS OF CURBS MAY BE ROUNDED TO 1-1/2" RADIUS WHICH IS BUILT INTO CURB FORMS; CORNERS OF TRANSVERSE FLOOR EXPANSION JOINTS SHALL BE ROUNDED WITH A 1/4" FINISHING TOOL UNLESS OTHERWISE REQUIRED ON PLANS; AND CORNERS OF EXPANSION JOINTS IN THE ROADWAY FACES AND TOPS OF CURBS AND SIDEWALKS SHALL BE ROUNDED TO A 1/4" RADIUS WITH A FINISHING STONE OR TOOL UNLESS OTHERWISE REQUIRED ON PLANS.

DOWELS:

DOWELS WHEN INDICATED ON PLANS AS FOR CULVERT EXTENSIONS, SHALL BE EMBEDDED AT LEAST 12" INTO THE OLD CONCRETE AND GROUTED INTO PLACE WITH 1:2 CEMENT MORTAR.

ALLOWANCE FOR DEAD LOAD DEFLECTION, SETTLEMENT: ETC. IN CASTING SUPERSTRUCTURES:

BRIDGES SHALL BE BUILT ON THE GRADE OR VERTICAL CURVE SHOWN ON PLANS. SLABS, CURBS AND PARAPETS SHALL CONFORM TO THE GRADE OR CURVE.

ALL DIMENSIONS WHICH ARE GIVEN IN SECTION AND ARE AFFECTED BY DEAD LOAD DEFLECTIONS ARE DIMENSIONS AT CENTER LINE OF BEARING UNLESS OTHERWISE NOTED ON PLANS. IN SETTING FORMS FOR STEEL BEAM BRIDGES AND PRESTRESSED CONCRETE GIRDER BRIDGES, ADJUSTMENTS SHALL BE MADE DUE TO THE DEAD LOAD DEFLECTIONS FOR THE ELEVATIONS SHOWN. WHERE BLOCKS ARE SHOWN OVER BEAMS FOR BUILDING UP TO THE SLAB, THE VERTICAL DIMENSIONS OF THE BLOCKS SHALL BE ADJUSTED BETWEEN BEARINGS TO COMPENSATE FOR DEAD LOAD DEFLECTIONS, VERTICAL CURVE ORDINATE, AND ACTUAL BEAM CAMBER. WHERE BOTTOM OF SLAB IS IN LINE WITH BOTTOM OF TOP FLANGES, DEPTH OF SLAB BETWEEN BEARINGS SHALL BE ADJUSTED TO COMPENSATE FOR DEAD LOAD DEFLECTION, VERTICAL CURVE ORDINATE, AND ACTUAL BEAM CAMBER.

IN SETTING FALSEWORK AND FORMS FOR REINFORCED CONCRETE SPANS, AN ALLOWANCE SHALL BE MADE FOR DEAD LOAD DEFLECTIONS, SETTLEMENT OF FALSEWORK, AND PERMANENT CAMBER WHICH SHALL BE PROVIDED FOR IN ADDITION TO THE ELEVATIONS SHOWN. AFTER REMOVAL OF THE FALSEWORK, THE FINISHED STRUCTURES SHALL CONFORM TO THE PROFILE AND ELEVATIONS SHOWN ON THE PLANS AND CONSTRUCTION ELEVATIONS FURNISHED BY THE ENGINEER.

DETAILED DRAWINGS FOR FALSEWORK OR FORMS FOR BRIDGE SUPERSTRUCTURE AND ANY STRUCTURE OR PARTS OF A STRUCTURE AS NOTED ON THE PLANS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL BEFORE CONSTRUCTION OF THE FALSEWORK OR FORMS IS STARTED.

REINFORCING STEEL:

ALL REINFORCING STEEL SHALL BE DEFORMED. DIMENSIONS RELATIVE TO PLACEMENT OF REINFORCING ARE TO CENTERS OF BARS UNLESS OTHERWISE INDICATED IN THE PLANS. DIMENSIONS ON BAR DETAILS ARE TO CENTERS OF BARS OR ARE OUT TO OUT AS INDICATED ON PLANS.

WIRE BAR SUPPORTS SHALL BE PROVIDED FOR REINFORCING STEEL WHERE INDICATED ON THE PLANS. WHEN BAR SUPPORT PIECES ARE PLACED IN CONTINUOUS LINES, THEY SHALL BE SO PLACED THAT THE ENDS OF THE SUPPORTING WIRES SHALL BE LAPPED TO LOCK LEGS ON ADJOINING PIECES.

STRUCTURAL STEEL:

AT THE CONTRACTOR'S OPTION, HE MAY SUBSTITUTE 7/8" Ø SHEAR STUDS FOR THE 3/4" Ø STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 - 7/8" Ø STUDS FOR 4 - 3/4" Ø STUDS, AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF 7/8" Ø STUDS ALONG THE BEAM AS SHOWN FOR 3/4" Ø STUDS BASED ON THE RATIO OF 3 - 7/8" Ø STUDS FOR 4 - 3/4" Ø STUDS. STUDS OF THE LENGTH SPECIFIED ON THE PLANS MUST BE PROVIDED. THE MAXIMUM SPACING SHALL BE 2'-0".

EXCEPT AT THE INTERIOR SUPPORTS OF CONTINUOUS BEAMS WHERE THE COVER PLATE IS IN CONTACT WITH BEARING PLATE, THE CONTRACTOR MAY, AT HIS OPTION, SUBSTITUTE FOR THE COVER PLATES DESIGNATED ON THE PLANS COVER PLATES OF THE EQUIVALENT AREA PROVIDED THESE PLATES ARE AT LEAST 5/16" IN THICKNESS AND DO NOT EXCEED A WIDTH EQUAL TO THE FLANGE WIDTH LESS 2" OR A THICKNESS EQUAL TO 2 TIMES THE FLANGE THICKNESS. THE SIZE OF FILLET WELDS SHALL CONFORM TO THE REQUIREMENTS OF THE CURRENT ANSI/AASHTO/AWS "BRIDGE WELDING CODE". ELECTROSLAG WELDING WILL NOT BE PERMITTED.

WITH THE SOLE EXCEPTION OF EDGES AT SURFACES WHICH BEAR ON OTHER SURFACES, ALL SHARP EDGES AND ENDS OF SHAPES AND PLATES SHALL BE SLIGHTLY ROUNDED BY SUITABLE MEANS TO A RADIUS OF APPROXIMATELY 1/16 INCH OR EQUIVALENT FLAT SURFACE AT A SUITABLE ANGLE PRIOR TO PAINTING, GALVANIZING, OR METALLIZING.

HANDRAILS AND POSTS:

METAL STANDARDS AND FACES OF THE CONCRETE END POSTS FOR THE METAL RAIL SHALL BE SET NORMAL TO THE GRADE OF THE CURB, UNLESS OTHERWISE SHOWN ON PLANS. THE METAL RAIL AND TOPS OF CONCRETE POSTS USED WITH THE ALUMINUM RAIL SHALL BE BUILT PARALLEL TO THE GRADE OF THE CURB.

METAL HANDRAILS SHALL BE IN ACCORDANCE WITH THE PLANS. RAILS SHALL BE AS MANUFACTURED FOR BRIDGE RAILING. CASTINGS SHALL BE OF A UNIFORM APPEARANCE. FINS AND OTHER DEFORMATIONS RESULTING FROM CASTING OR OTHERWISE SHALL BE REMOVED IN A MANNER SO THAT A UNIFORM COLORING OF THE COMPLETED CASTING SHALL BE OBTAINED. CASTINGS WITH DISCOLORATIONS OR OF NON-UNIFORM COLORING WILL NOT BE ACCEPTED. CERTIFIED MILL REPORTS ARE REQUIRED FOR METAL RAILS AND POSTS.

SPECIAL NOTES:

GENERALLY, IN CASE OF DISCREPANCY, THIS STANDARD SHEET OF NOTES SHALL GOVERN OVER THE SPECIFICATIONS, BUT THE REMAINDER OF THE PLANS SHALL GOVERN OVER NOTES HEREON, AND SPECIAL PROVISIONS SHALL GOVERN OVER ALL. SEE SPECIFICATIONS ARTICLE 105-4.

ENGLISH

JANUARY, 1990